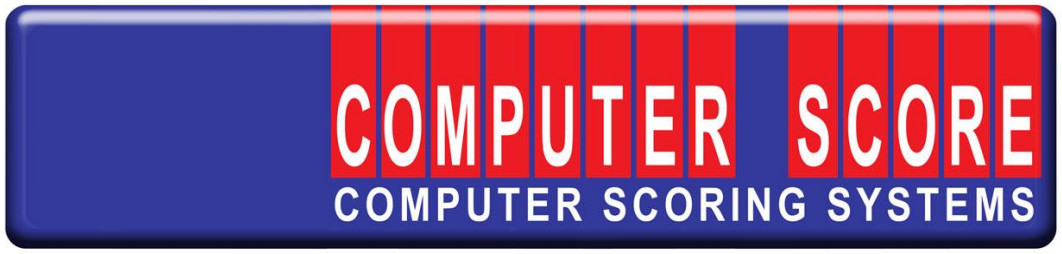


Duo
Installation Instructions
&
Reference Guide

Table of Contents

OVERVIEW **1**

POWER REQUIREMENTS 2
FCC DECLARATION OF CONFORMITY 3

CHAPTER 1: HANG THE DISPLAYS **4**

OPTION1: PURCHASE DISPLAYS FROM YOUR COMPUTER SCORE REPRESENTATIVE 4
OPTION2: PURCHASE YOUR OWN DISPLAYS. 5
Comments on choosing a display *5*
Commercial Grade vs Domestic Grade: 5
Inputs: 5
Quality: 5
Presence: 5
Service: 5
Spares: 5
RS-232: 5
Try It: 5
Connectors *6*
VGA Input 6
DVI Input 6
RS-232 Input 6
AV Input 6
AV Output 6

CHAPTER 2: RUN THE CABLES **7**

COMMON CABLES 8
LLAN Communications Backbone *8*
DCC IP Score Camera Cable *9*
DUP IP Camera Power *9*
Optional Network Cable (DNC) *10*
TYPE A SYSTEMS 12
Machine Connection Cable (DMO & DME) *13*
Brunswick A and A2 13
AMF 82-30 15
AMF 82-70 18
AMF 82-70 with MP Chassis 20
AMF 82-70 with MK Expander 22
AMF 82-70 with XOP Chassis 24
AMF 82-90 (Large Chassis) 26
Xima Pinsetter 28
VIA Pinsetter 30
TYPE B SYSTEMS 32
Machine Communications Cable (DXL) *33*
AMF 8800 Gold, 82-90XL and 90XLi 33
TYPE C SYSTEMS 35
Machine Connection (DGX or DG9) *35*
Brunswick GS-X (DGX) or Late Model GS-98 36
Brunswick GS-10 / 96 / 98 with Pinsetter Interface Controller fitted (DG9). 37

CHAPTER 0 2 8 1 7 7 + (% 2 : **S(KEYPAD CONSOLE** **38**

CONCRETE FLOORS 38
TIMBER FLOORS 38

CHAPTER 4: SECURE THE CAPPING **39**

WOODEN AND PLASTIC CAPPING 39
METAL CAPPING 40

CHAPTER 5: ACCOUNTING FOR BUMPER RAILS **41**

NO BUMPERS 41
VERTICAL BUMPERS AND BALL WALL 42
AMF HORIZONTAL SWING OUT TYPE 42

CHAPTER 6: INSTALL THE DUO CAMERA MODULE **43**

Fixed IP Address *94*
VIEWING THE SCORING LOG 94
Saving the System Log *94*
Reboot and run Check Disk *94*
FINE TUNING THE SCORING SETUP 95
Take Data Delay *95*
Advanced Pinsetter Timings *95*
Synchronise the frame to 1st Ball 96
ADJUST CAMERA 96
Score Camera *96*
Find the Pins 96
Manually Moving a Pin 97
Changing Brightness Levels 97
Specify the type of Camera 97
Player Camera *98*
Zoom In and Adjust position 98
Save Last Delivery 98

APPENDIX B –AUTOMATIC BUMPERS 99

AMF (AND OTHERS) AUTOMATIC BUMPERS 99
1. Setup Duo CPU Module *100*
2. Setup Center Command *100*
BRUNSWICK AUTOMATIC BUMPERS 101
Type A Systems *101*
Type B Systems *101*
Type C Systems *102*
1. Configure the Brunswick Bumper Controller *103*
2. Setup Duo CPU Module *104*
3. Setup Center Command *104*
USING AUTOMATIC BUMPERS 105
Method 1: Via the Name Entry Screen. *105*
Method 2: Via League Setup *105*
Method 3: Via the Override buttons. *105*

APPENDIX C –AMF MANAGERS CONTROL UNIT CONNECTION 106

INSTALLING THE MCU INTERFACE CONTROLLER 108
A. Install driver for USB to RS232 converter *108*
B. Create Startup Shortcut *109*
C. Setup the Center Command Software *109*
USING THE MCU INTERFACE 109

APPENDIX D –SWITCHING TO A VIDEO SOURCE 110

DVT SERIAL CABLE 111

APPENDIX E –SETTING BIOS ENTRIES ON THE DUO CPU MODULE 113

WHAT IS THE BIOS? 113
WHEN WOULD I NEED TO SET THE BIOS DEFAULTS? 113
SETTING BIOS DEFAULTS IN THE DUO HARDWARE MODULES 113
Main Menu *114*
Menu Item 1: Standard CMOS Features *114*
Menu Item 2: Advanced BIOS Features *115*
Menu Item 3: Advanced Chipset Features *115*
Menu Item 4: Integrated Periphals *116*
Menu Item 4 ±1: On Chip IDE Device 116
Menu Item 4 ±2: Onboard Device 117
Menu Item 4 ±3: Super IO Device 117
Menu Item 4 ±4: USB Device Setting 118
Menu Item 5: Power Management Setup *118*
Menu Item 6: PnP / PCI Configuration *119*
Menu Item 7: PC Health Status *119*

APPENDIX F –PREVENTATIVE MAINTENANCE 120

DUO CPU MODULE 120
DUO CAMERA MODULE (IF FITTED) 120

2 Y H U Y L H Z

Thank you for purchasing the Duo Automatic Scoring system. The Duo hardware should be able to be easily installed by a team of two or three people with a reasonable degree of technical competence.

The Duo system consists of three parts:

1. The Duo CPU Module, which is responsible for all communications to the front counter as well as displaying the scoregrids and exciter animations.
2. Duo Camera Module, which is responsible for viewing the Pins in order to determine the score, as well as communications with the machine in order to cycle them and turn them on & off.
3. Duo Keyboard Module, which your bowlers use on the lanes.

Note: For Brunswick GS series machines, the Duo Camera Module is not required at all as the Duo CPU module communicates directly with the GS machine in order to determine the score.

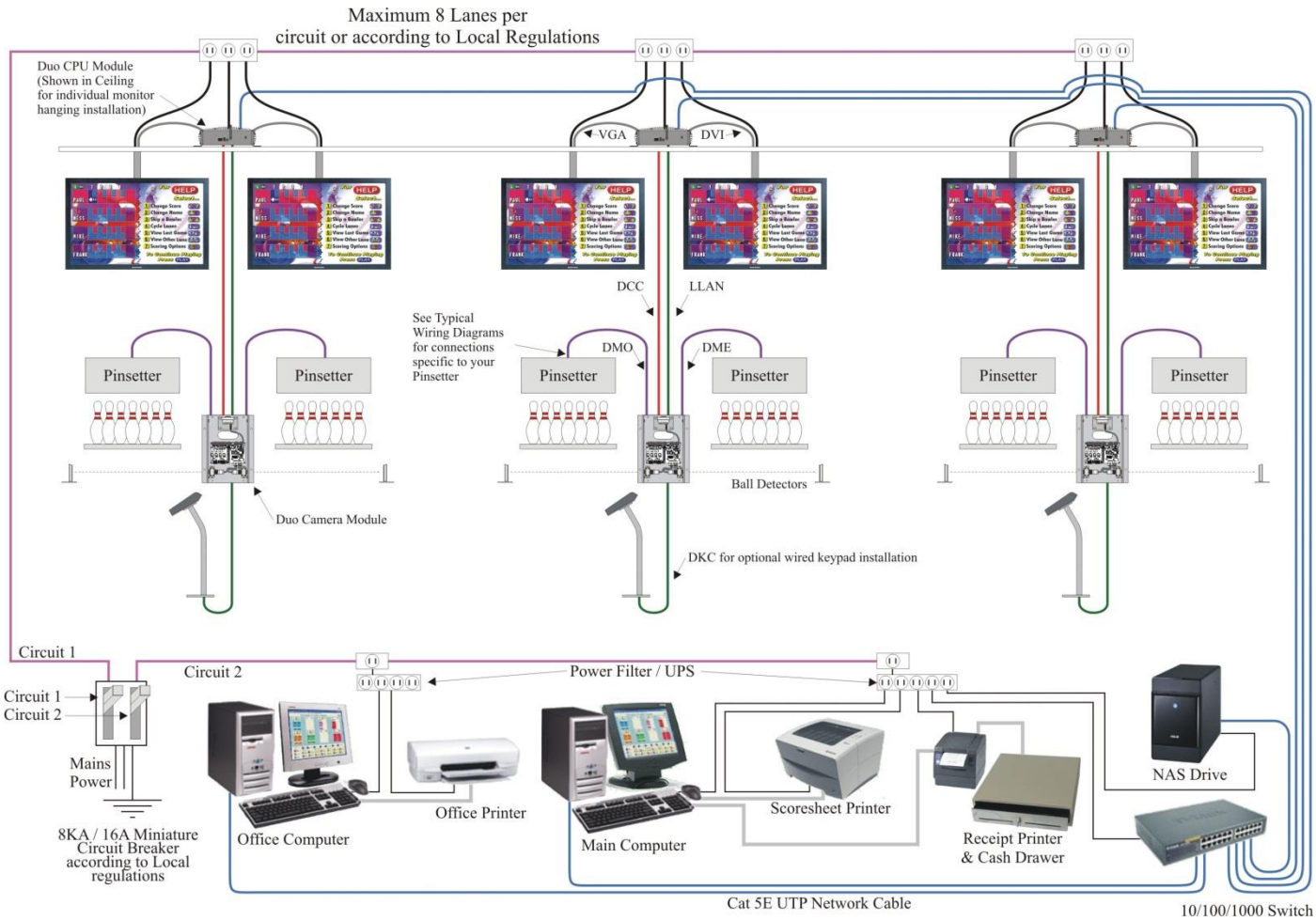
The Duo scoring system is designed to be self-installed with a minimum of electronic hardware modules, using V W D Q G D U G / & ' ¶ V 3 O D V P D 3 D Q H O V R U D Q \ R W K H U G L V S O D \ W H F K Q R O R J \ W These displays can be purchased and supported by a local supplier, which allows you the security of having the support of the biggest potential source of service issues close at hand.

Power Requirements

There are at least two power circuits that need to be present for the system to function (Shown in Pink, below):

1. Display Units. There must be a power available to the display units in the ceiling. There must be a GPO (General Purpose Outlet) for each monitor and also one for the Duo unit. There is a maximum of 8 lanes per circuit or lower, depending on your local power regulations.
2. Computer Equipment. There must also be a separate circuit available for the front end Computer Equipment. It is recommended that this circuit not only is separate from the Duo Units and Monitors, but it should also be on a separate circuit from the remainder R I W K H F H Q W H U ¶ V S R Z H U

Note: A licensed electrician MUST do Any high voltage electrical work. It may be necessary to contact a licensed electrician to pre-install these power circuits BEFORE starting installation.



FCC Declaration of Conformity

PRODUCT NAME: Duo

MODEL NUMBER:

FCC RULES: TESTED TO COMPLY WITH FCC PART 15, CLASS B

OPERATING ENVIRONMENT STATEMENT: COMMERCIAL USE

FCC COMPLIANCE STATEMENT:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

INFORMATION TO USER:
This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient / Relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION:
Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the users authority to operate the equipment.

&KDSWHU +DQJ WKH 'LVSOD\V

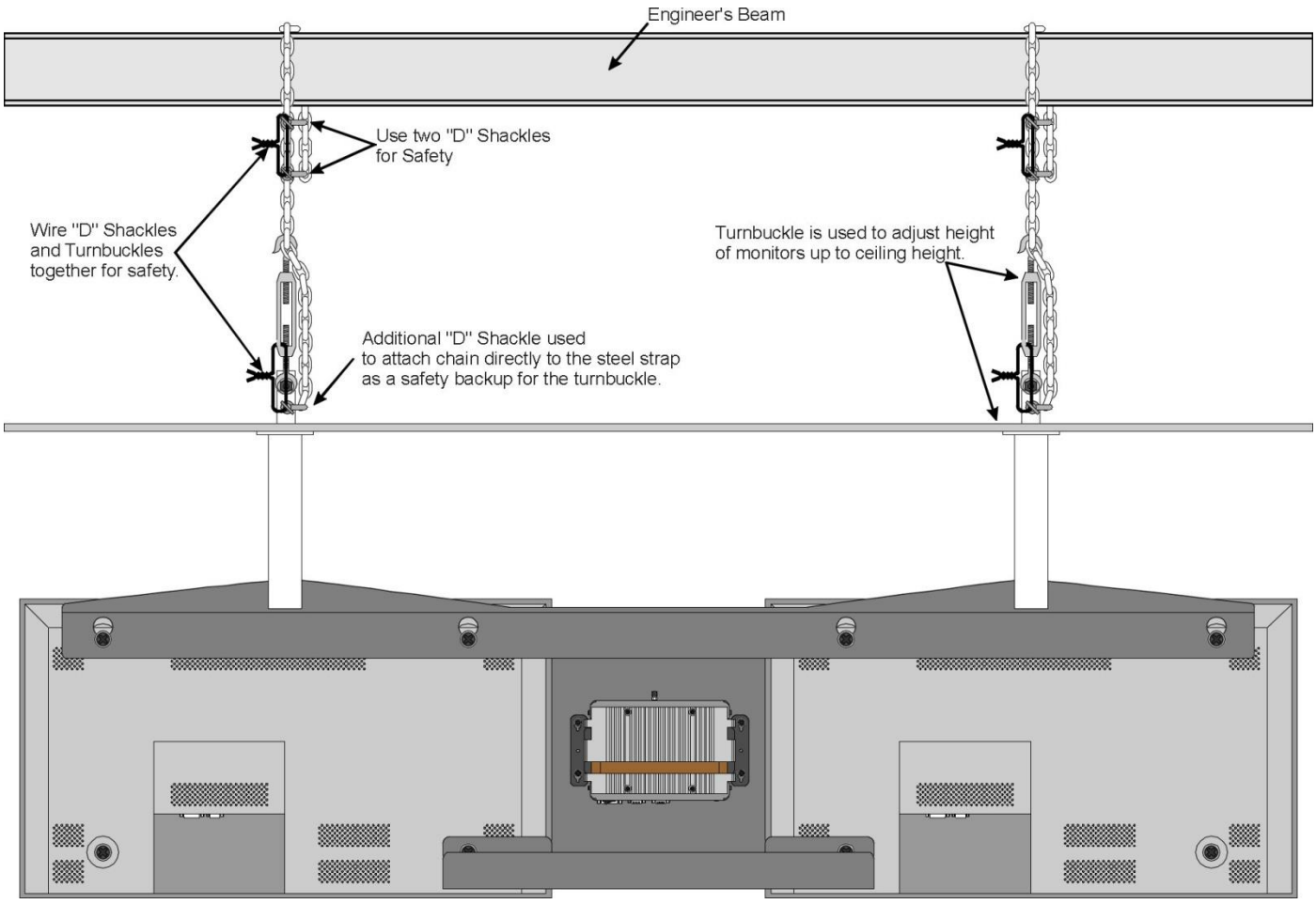
The Duo system can be used with any type of display that can accept both a VGA and a DVI signal. This will often involve a TV that is either a Glass CRT (Cathode Ray Tube) or more commonly a TV that uses a LCD (Liquid Crystal Display) panel. Either way, you must also purchase and arrange for these displays to be hung from the ceiling.

Note: Any mounting hardware should be secured to the ceiling under advice from a local structural engineer who can verify that your ceiling purlins or other suspension framework is strong enough to support the weight of the monitors.

Option1: Purchase displays from your Computer Score representative

Your Computer Score representative is able to supply (and install, if needed) displays and hanging brackets that have been manufactured specifically to suit the displays that will be supplied. An example of this arrangement is shown below.

Note: Mounting arrangement is subject to change without notice.


Engineer's Beam
Use two "D" Shackles for Safety
Wire "D" Shackles and Turnbuckles together for safety.
Turnbuckle is used to adjust height of monitors up to ceiling height.
Additional "D" Shackle used to attach chain directly to the steel strap as a safety backup for the turnbuckle.

Option2: Purchase your own displays.

There are a number of manufacturers of mounting brackets for TVs and other displays that can be readily seen in Bars, Clubs and other facilities. This is a large industry, which should have a number of local suppliers who can advise you on the various methods on mounting displays onto the ceiling.

Following are the web site addresses of some, but not all, of the major manufacturers of this type of equipment:
www.atdec.com
www.pivotelli.com
www.peerlessindustries.com

Comments on choosing a display

Obviously, price can have a large bearing on the decision for which display to purchase to use with the system, but the following factors should also be taken into account when purchasing displays:

Commercial Grade vs Domestic Grade:

Although Domestic TV screens are cheaper than Commercial Grade displays, using a Domestic TV **MAY** produce some issues. It may be possible that you will void the warranty if you use a Domestic TV in a commercial setting. Also, as a general statement, a commercial grade panel will be of higher quality than a domestic grade panel. This may result in a longer life span with fewer problems. Commercial Grade monitors are also designed to remain the same in appearance across multiple hardware versions. The appearance of Domestic Grade monitors are constantly changing and it may be difficult to source the same monitor after a short period of time.

Inputs:

Your display MUST be able to accept BOTH VGA and DVI inputs. This is because with the Duo system, the Odd Lane is using the VGA output of the Duo CPU Module and the Even Lane uses DVI. If DVI is not available, then you can use a HDMI input instead.

Warning: Some older LCD TVs may OVERSCAN a PC signal when using HDMI. This means that Left and Right edge of the image may be off the screen. Newer TVs have the option of turning off overscan from within their menu system. You should check that this is the case before purchasing your displays.

Quality:

The cheapest display is not necessarily the best. Consider that the usual life of a scoring system is at least 10 years and that any monitor that will be reliable for that length of time must be well built. (and well maintained) As a general statement, LCD TV screens will be more reliable long term than glass CRT TV screens or Plasma panels.

Presence:

Go with a supplier who is reputable and present in the market. Commonly, a manufacturer with an unknown brand may not last long term, making spares and repair work hard to achieve.

Service:

Choose a supplier with a local repair agent. Sometimes a manufacturer will actually include the schematic diagra P IRU WKH PRQLWRU¶V HOHFWURQLFV ZLWK WKHLU RWKHU GRFXPHQW

Spares:

Strongly consider purchasing additional units for spare parts as insurance against failure that cannot be repaired. (Or replaced with an equivalent unit) Spare units are often put into service as TV screens in the Bar or Café until they are required.

RS-232:

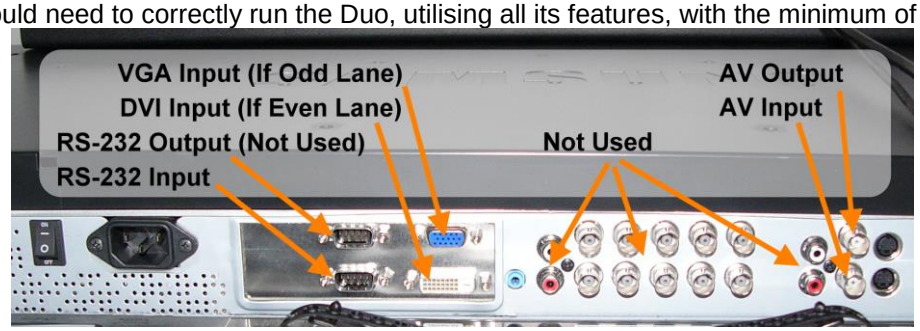
Your displays should also be able to accept an RS232 serial data signal to include the ability to select the video source on the monitor via serial connection. This will facilitate the feature, which allows the bowlers to watch TV on one screen while both score grids are displayed on the other screen. This also allows video to be displayed on the screen when it is not being used for D VFRUH JULG 7KLV LQSXW -LV XVHG [illegible] more information on switching video sources.

Try It:

The Duo unit is small enough that it should be possible to take one to your local TV retailer to test the quality of the TV¶V GLVSOD\ RI WKH YLGHR VLJQDO $OWKRXJK WKLV LV QRW HVVHQW one, and allow you to be confident that your choice will work with the equipment.

Connectors

The image below is from a Samsung 400PX commercial display. It represents a very good display with all the connectors that you would need to correctly run the Duo, utilising all its features, with the minimum of complications.



Below is a summary of the connectors used: (Like most TVs, there are some connectors that are not used.)

VGA Input

Plug in the Odd Lane Video output from the Duo CPU module into here, if the monitor is on the Odd Lane.

DVI Input

Plug in the Even Lane Video output from the Duo CPU module into here, if the monitor is on the Even Lane. If your monitor does not have DVI input, then you can use a HDMI input instead. However, you may experience OVERSCAN, as discussed above.
If this is the case, and you are not able to stop your monitor from over scanning from within its menu settings, then you are still able to purchase, at additional cost, a converter which will allows you to plug into the VGA input for the Even lane. Contact your Computer Score representative for more information.

RS-232 Input

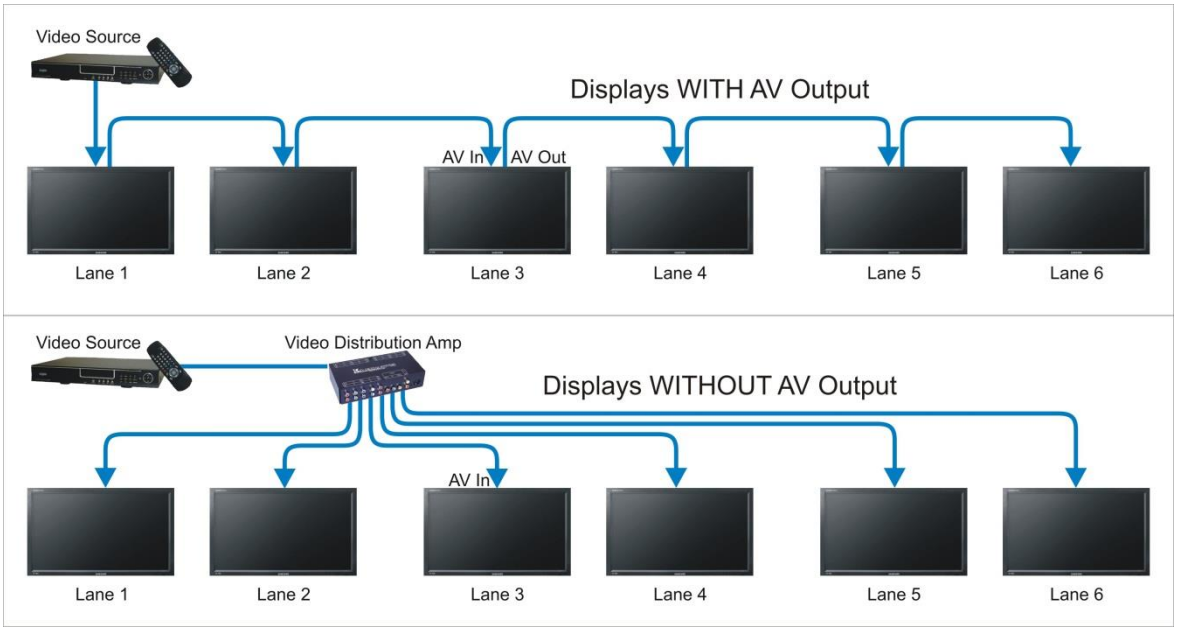
Plug in the Monitor control cable from the Duo CPU module, for the appropriate lane. This serial communications port allows the Duo CPU module to tell the display to switch channels from Scoregrid to AV and back. See Chapter 8 and also Appendix D for more information on this feature.

AV Input

Plug in your Audio Visual (AV) source into this plug to allow the monitor to display video.

AV Output

The AV Output plug repeats whatever signal is coming into the AV Input. This Output also amplifies the AV signal slightly to allow the video cable to daisy chain from one monitor to another, without having to go to the extra expense and cabling of a video distribution amp.
It is the responsibility to the center to supply the monitors with an AV video signal. See your AV equipment supplier for more information.



&KDSWHU 5XQ WKH &DEOHV

There are three different methods to communicate to the Pinsetters. The manufacturer and model of the Pinsetter installed at your Bowling Center dictate which method is used and how the system is cabled:

- Type A 7KLV W\SH XVHV WKH 'XR &DPHUD 0RGXOH¶V 0DFKLQH &RQQHF in the pair. Machine connection relies on relays to open and close a switch contact, ZKLFK LV WKHQ ZLUHG LQWR WKH 3LQVHWWHU¶V FRQWURO ER For example: to perform a function such as cycle the lane, the Duo system closes a relay, which completes a circuit that is wired in parallel to the cycle pinsetter button at the ball return.

- Type B 7KLV W\SH XVHV WKH 'XR &DPHUD 0RGXOH¶V 0DFKLQH &RPPXQ connection takes advantage of the more advanced functions of the AMF 82-90XL and 90XLi Pinsetters. 7KH FDEOH LV SOXJJHG LQWR 3LQVHWWHU¶V HOHFV communicates directly to both lanes via their common control chassis. For Example: to perform a function such as cycle the lane, the Duo sends a command to the Pinsetter, which then starts a cycle. In a Type B connection, it is the Duo that tells the machine what score was bowled and what to do.

- Type C 7KLV W\SH LV GHVLJQHG IRU FRQQHFWLQJ WR %UXQVZLFN¶V Chassis) machines as well as GS-10, 96 & 98 machines. (That include the Pinspotter Interface box) This connection type takes advantage of the LLAN backbone to communicate without the need to have a Duo Camera Module at all. In a Type C connection, it is the Pinspotter that determines the score and tells the Duo what to display on the screen.

Note: Although the terms Pinspotter and Pinsetter refer to Brunswick or AMF machines, they are used interchangeably for the purposes of this installation guide.

Type A Systems

Common Cables	Pinsetter	Machine Connection Cable
LLAN DCC DNC	Brunswick A and A2	DMO-A2 & DME-A2
	AMF 82-30	DMO-30 & DME-30
	AMF 82-70	DMO-70 & DME-70
	AMF 82-70 MP Chassis	DMO-70MP & DME-70MP
	AMF 82-70 MK Expander	DMO-70MK & DME-70MK
	AMF 82-90	DM-90
	Xima Pinsetter	DMO-XM & DME-XM

Type B Systems

Common Cables	Pinsetter	Machine Connection Cable
LLAN DCC DNC	AMF 8800 Gold	DXL
	AMF 82-90XL	
	AMF 90XLi	

Type C Systems

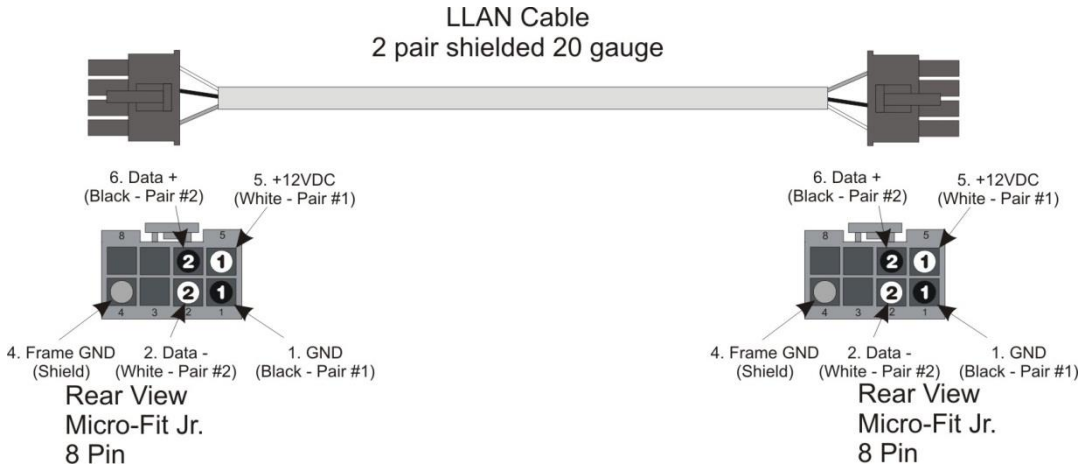
Common Cables	Pinsetter	Machine Connection Cable
LLAN DNC	Brunswick GS-10 (With Pinsetter Interface Controller)	DG9
	Brunswick GS-92 (With Pinsetter Interface Controller)	
	Brunswick GS-96 (With Pinsetter Interface Controller)	
	Brunswick GS-98 (With Pinsetter Interface Controller)	
	Brunswick GS-98 (Consolidated Chassis)	DGX
	Brunswick GS-X (Next Gen Chassis)	

Common Cables

Although the cable that connects to each type of pinspotter is different, there are several cables that are used for some or all of the different classes of system.

LLAN Communications Backbone

The LLAN cable is used in Type A, Type B and Type C systems.

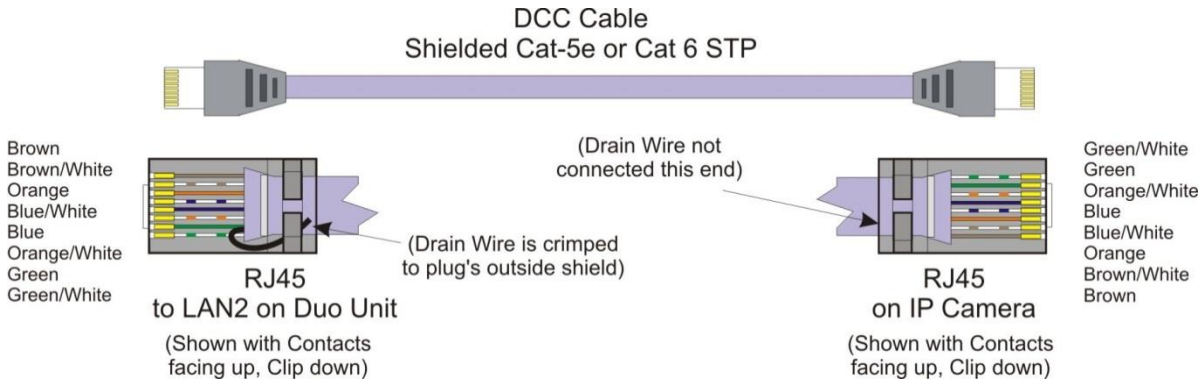


The LLAN is the main communications backbone between all components of the Duo system. The LLAN cable can be of varying lengths in different situations. However, the wiring of this cable is always the same. It is used to make the main communications connection the Duo CPU module, the Duo Camera Module and also the Duo % R Z O H U ¶ V N H \ S D G

Note: *All cables should be routed as far as practical away from sources of power or RF interface such as fluorescent lights and transformers.*
It is important to consider occupational health and safety issues when routing these cables. Each installation will vary depending upon the nature of the ceiling, however minimum precautions should include gloves, eye protection, and a dusk mask. An approved platform should be used to give safe access to the ceiling. Some ceilings may have insulation and therefore require protective clothing to be worn. If in doubt about the nature of this task it is advisable to contract a licensed electrical contractor to route the cables.

DCC IP Score Camera Cable

The DCC cable is used in Type A and Type B systems. It is not used in Type C Systems.



The DCC cable is used to carry signal from the Duo CPU module to the IP Camera at the Duo Camera module. This signal is in the form of a network connection, which is shielded to help protect from interference. The Duo Camera Module is not present in Type C systems, so the DCC and DUP cables are not used in this situation.

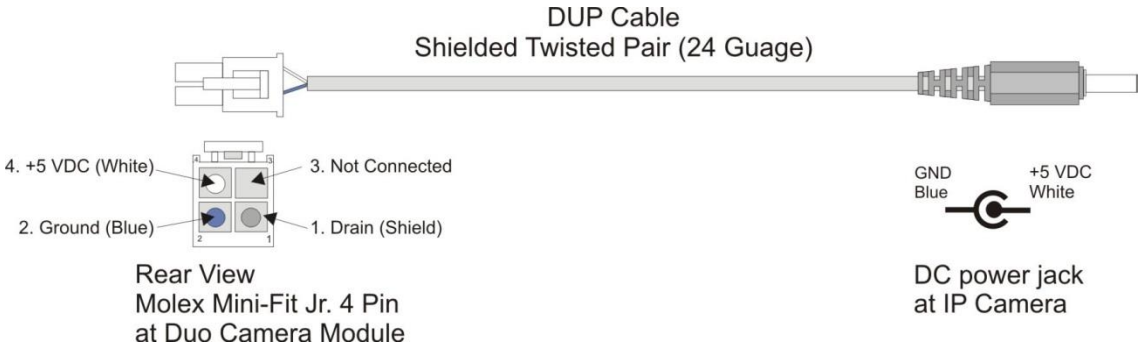
The Duo system uses a IP Camera as its choice of camera because they are produce a, color, high resolution and extremely reliable image. This is an example of using the price advantages of main stream computing to achieve maximum benefit for the price competitiveness of your system.

Note: *When installing this cable, make sure that the end with the Drain Wire connected is at the DUO CPU Module end, not the IP Camera End. This is ensure proper dispersal of static electricity that could be induced onto the cable.*

Note: *Even though the DCC cable is shielded, all cables should be routed as far as practical away from sources of power or RF interface such as fluorescent lights and transformers.*
It is important to consider occupational health and safety issues when routing these cables. Each installation will vary depending upon the nature of the ceiling, however minimum precautions should include gloves, eye protection, and a dusk mask. An approved platform should be used to give safe access to the ceiling. Some ceilings may have insulation and therefore require protective clothing to be worn. If in doubt about the nature of this task it is advisable to contract a licensed electrical contractor to route the cables.

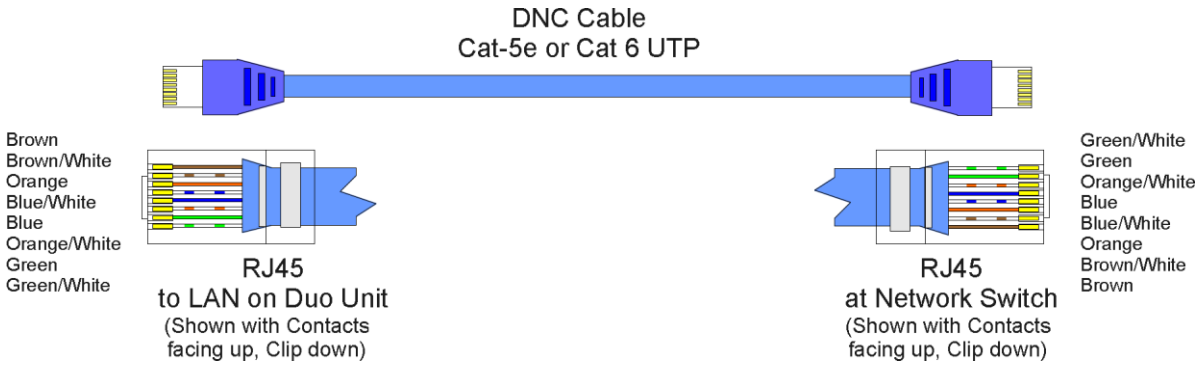
DUP IP Camera Power

This cable provides power for the IP Camera located inside the DUO Camera module. It is supplied pre-installed inside the Dup Camera module, ready for use. You should not need to install it.

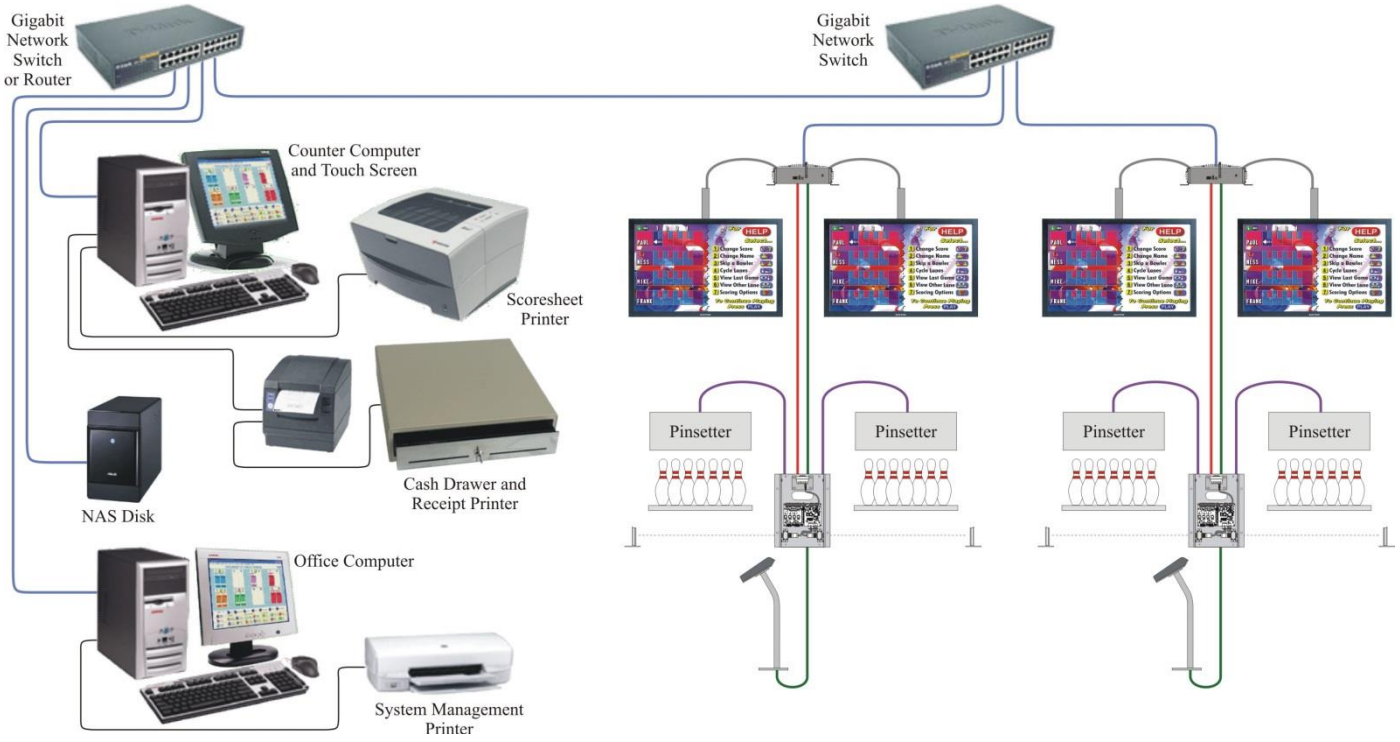


Optional Network Cable (DNC)

The DNC cable is used in Type A, Type B and Type C systems.

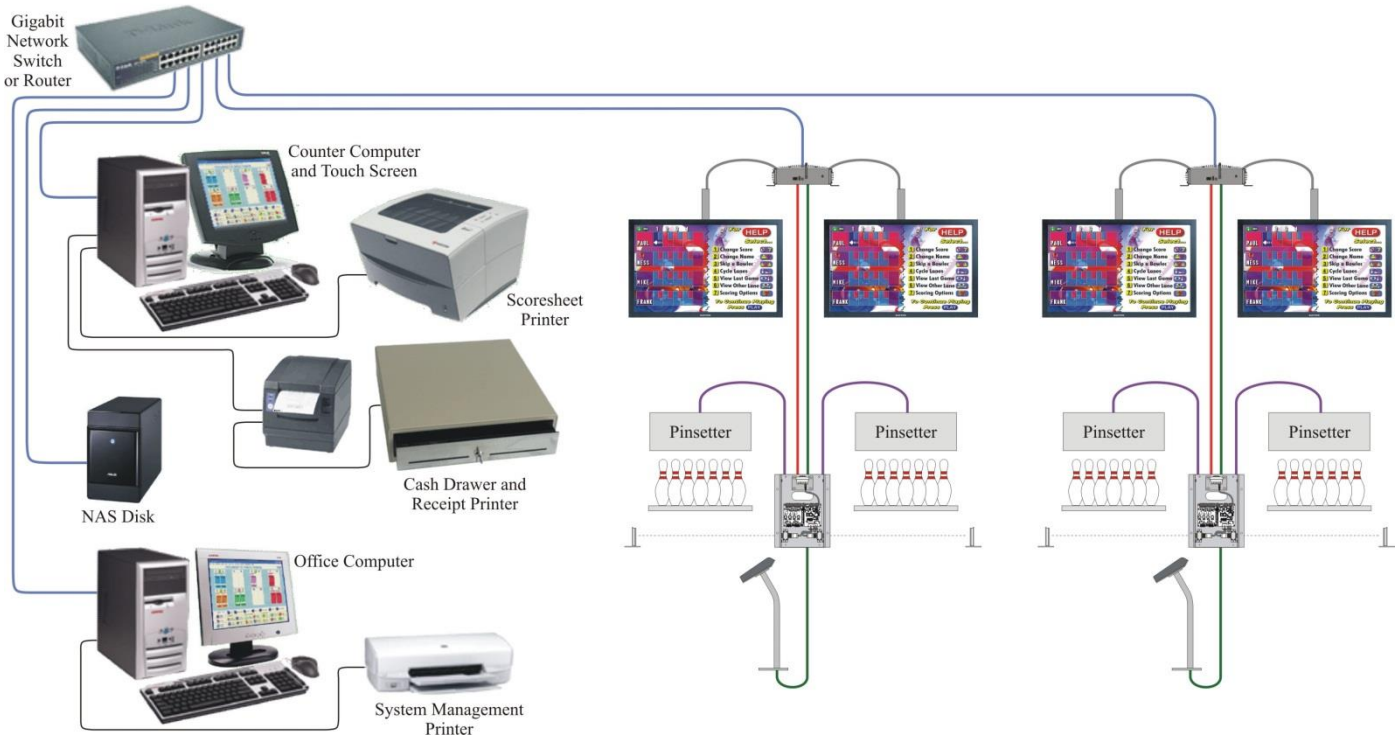


The Duo system is designed to have a stand alone basic scoring functionality, without the need to connect any computers at all. However, if you wish to control the lanes from a computer on the front counter, you will need to connect the Network Cable. (DNC) This cable is shown here in Blue. This optional CAT5e or Cat 6 cable will allow the Duo system to interface with the Center Command software suite and allow you to fully control your systems functions including several optional software modules such as Point of Sale, League Secretarial and System Management. See Chapter 10 for more information on setting up your computers and printers for use with the Duo Scoring System.



The DNC Cable is run from the Duo CPU module forward to a convenient place where a Gigabit (1000Mbit) network switch for all lanes is located. A second switch or a router can then be placed near the optional system management computers so that just a single cable need be run from the office to the lanes area.

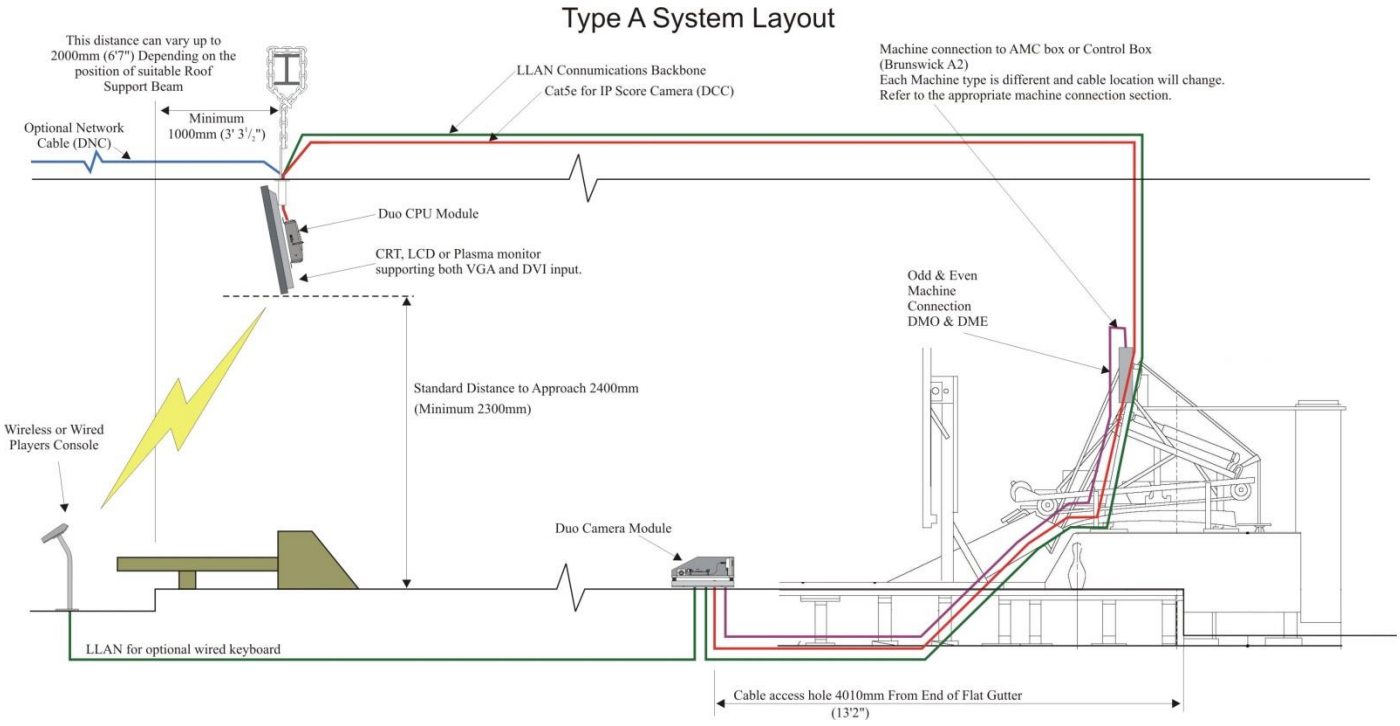
Alternatively, a single switch can be used, however in this case all network cables must be run to that position. The advantage of this is that the networking is simpler and more efficient. It is for this reason that this method is the one recommended by Computer Score. The disadvantage is that there is more work involved in running the cables.



Type A Systems

For each pair of lanes in a standard Type A installation there are five communications cables:

1. LLAN This cable runs from the Duo CPU module to the Duo Camera module. Another LLAN cable is then run from the Duo Camera module to the optional wired connection for the %RZOHU¶V .H\SDG 7KLV FDEOH VXSSOLHV ERWK SRZHU DQ
2. DCC This cable runs from the Duo CPU module to the Duo Camera module. This cable supplies video signal from the camera.
3. DNC This optional cable runs from the Duo CPU module to a network switch in order to gain communications to the Center Command front desk software.
4. DMO This cable runs from the Duo Camera module to the location on the odd lane pinspotter where the Duo system can tell the machine to turn on and cycle. The location and configuration of this cable with change according to the model of pinspotter installed. Please refer to the Machine Connection section of this manual for further information on your type of pinspotter.
5. DME This cable runs from the Duo Camera module to the location on the even lane pinspotter where the Duo system can tell the machine to turn on and cycle. The location and configuration of this cable with change according to the model of pinspotter installed. Please refer to the Machine Connection section of this manual for further information on your type of pinspotter.


Type A System Layout
This distance can vary up to 2000mm (6'7") Depending on the position of suitable Roof Support Beam
Minimum 1000mm (3' 3½")
Optional Network Cable (DNC)
LLAN Connumications Backbone
Cat5e for IP Score Camera (DCC)
Machine connection to AMC box or Control Box (Brunswick A2)
Each Machine type is different and cable location will change.
Refer to the appropriate machine connection section.
Duo CPU Module
CRT, LCD or Plasma monitor supporting both VGA and DVI input.
Odd & Even Machine Connection DMO & DME
Standard Distance to Approach 2400mm (Minimum 2300mm)
Wireless or Wired Players Console
Duo Camera Module
LLAN for optional wired keyboard
Cable access hole 4010mm From End of Flat Gutter (13'2")

After all cables have been run, they should all be checked to make sure that they are not in danger of being cut by any moving parts in the pinspotter, or by a ball hitting them in the ball track area under the lanes. In addition, all the cables should be tied together at the Duo Camera Module and securely tied up out of the way of any balls travelling past on the ball track.

Machine Connection Cable (DMO & DME)

Brunswick A & A2 as well as AMF 82-30 & 82-70 Pinsetters are only capable accepting the basic on / off and cycle commands whereas all other later Pinsetter types are capable of accepting advanced commands such as 7 - 10 pick off, strike cycles and short cycles.

The following Pinsetters use the Machine Connection port on the Duo Camera Module where as others use the Machine Communications port as discussed in the next section. Cable designations for Pinsetters using the Machine Connection port are as follows:

Pinsetter	Cable Designation
Brunswick A and A2	DMO-A2 DME-A2
AMF 82-30	DMO-30 DME-30
AMF 82-70	DMO-70 DME-70
AMF 82-70 MP Chassis	DMO-70MP DME-70MP
AMF 82-70 MK Expander	DMO-70MK DME-70MK
AMF 82-90	DM-90
Xima Pinsetter	DMO-XM DME-XM
VIA Pinsetter	DMO-VIA DME-VIA

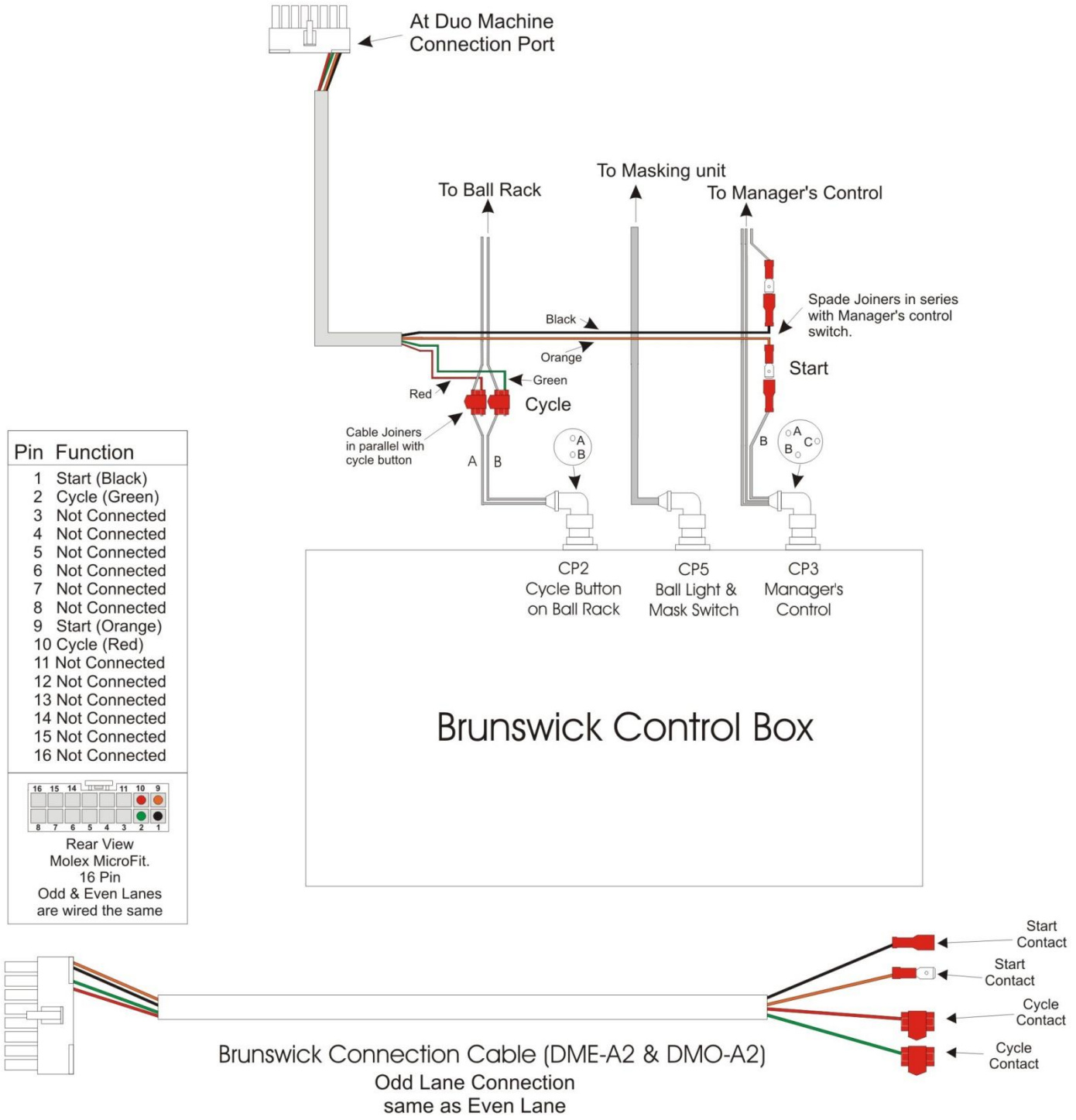
Brunswick A and A2

Run both the DMO-A2 (Odd Lane) and DME-A2 (Even Lane) cables from the Duo Camera Module, along the Ball Track, up the kickback, and then up the A-frame to the Control box on the Odd and Even lanes respectively. Make sure you route all cables away from moving parts, so there is no chance of the cables being crushed or cut.

The start contacts are connected in series to the managers control switch and the cycle contact is wired in parallel to the cycle button from the ball return.

Note: *The Duo unit's start contacts must be connected in series (in line) not in parallel with (across) the manager's control switch. This is to ensure that when the manager's control switches are switched off the pinsetter will turn off. Normal operation will see the Manager's control switch turned on, the pinsetter will turn on and off with the games bowled. If, however, there is an urgent need to turn the pinsetter off it can be done quickly using the Manager's control switches.*

Typical Brunswick A and A2 Connection



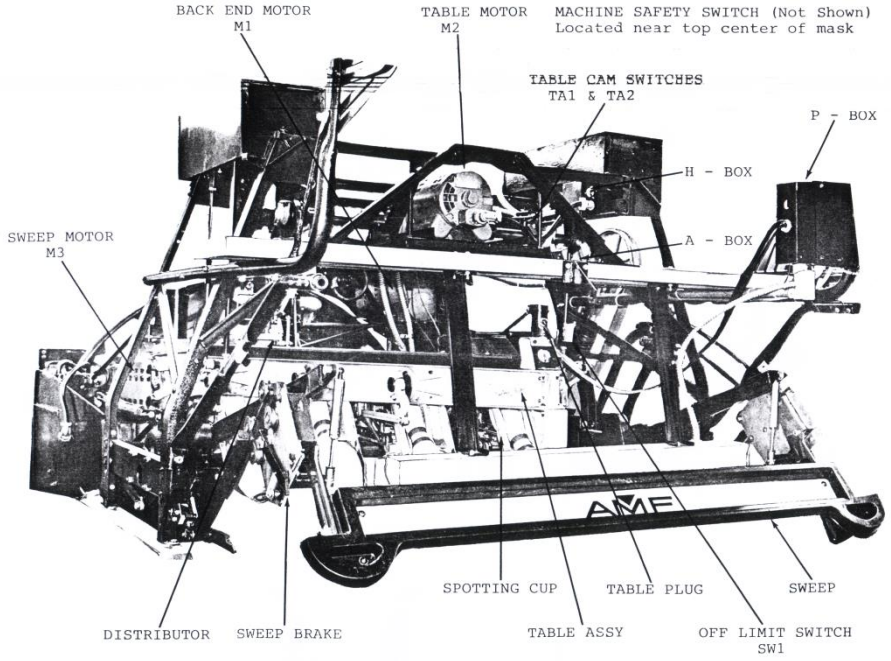
AMF 82-30

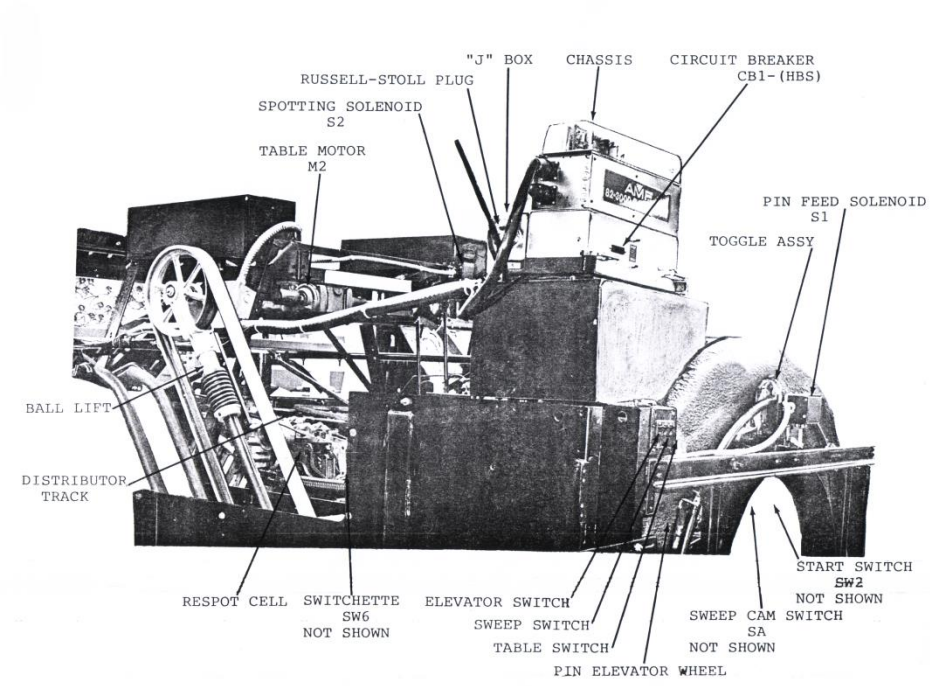
Run both the DMO-30 (Odd Lane) and DME-30 (Even Lane) cables from the Duo Camera Module, along the Ball Track, and up the kickback to the Odd and Even lane Pinsetter respectively.

7KH 6WDUW FDEOH LV ZLUHG WR WKH ³3´ %R[DW WKH HLVI UZRQW GR WW KWHK
Again, the start contact is wired in series to the managers control switch and the cycle contact is wired in parallel to the cycle button from the ball return.

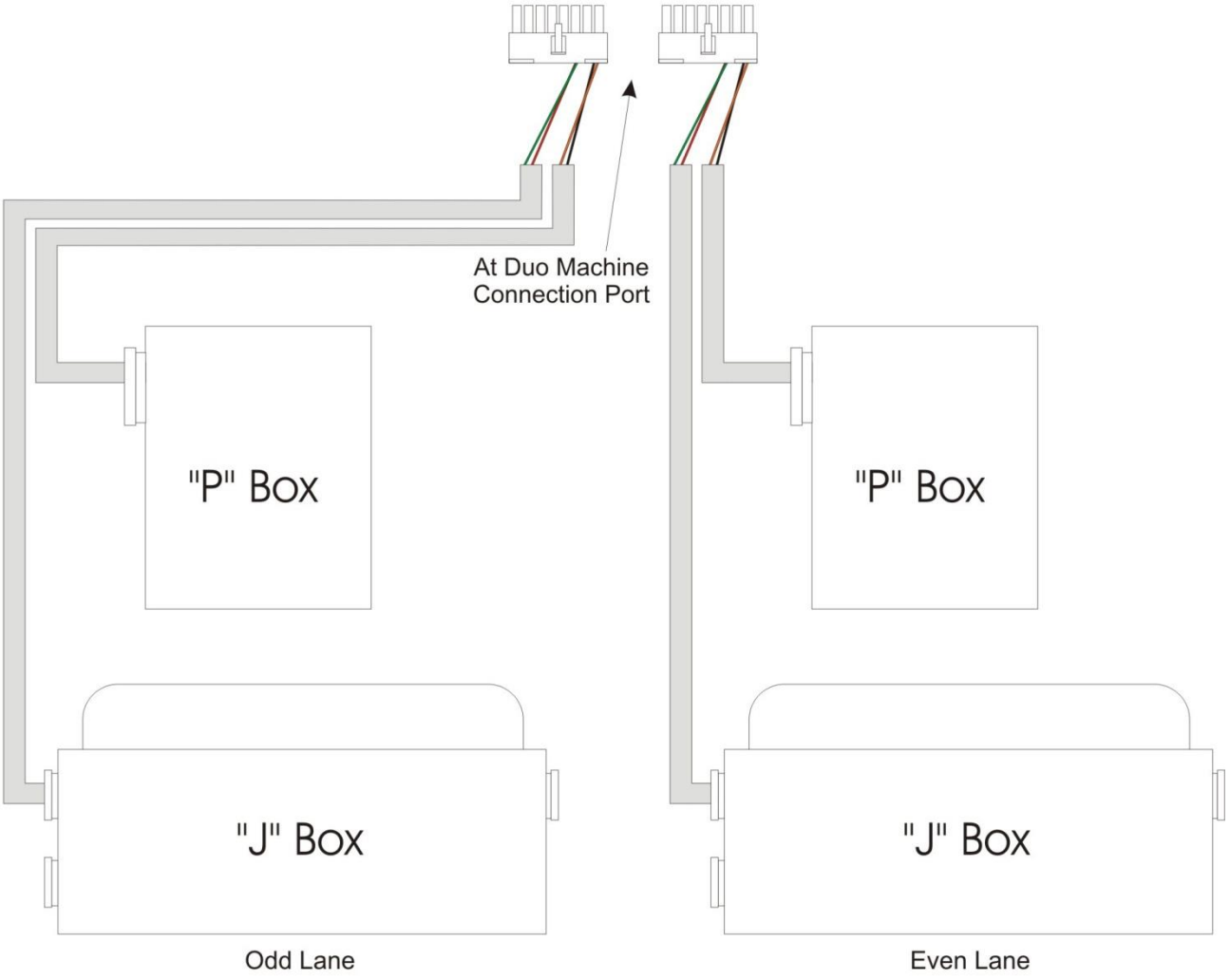
Warning: *Beware of high voltage present in the J Box. You MUST turn off AND isolate the pinsetter BEFORE working on it.*

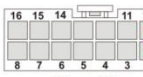
Warning: *You MUST NOT connect the foul to the Duo Scoring Module or YOU WILL DAMAGE IT. Many 82-30 machines use a high voltage foul signal. Duo accepts the low voltage foul signal only.*





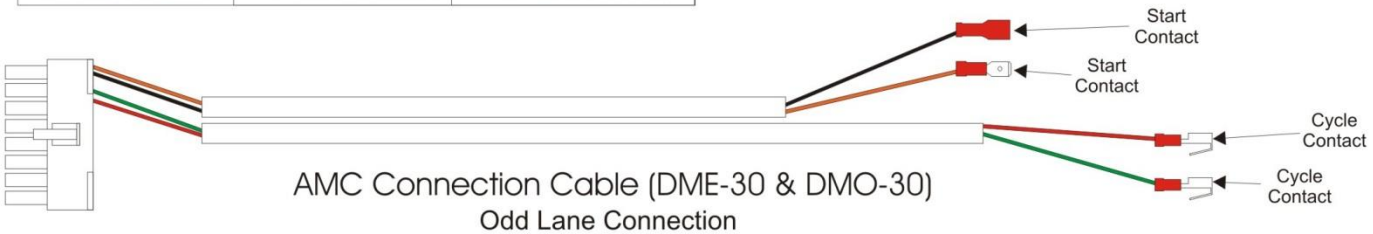
Typical AMF 82-30 Machine Connection



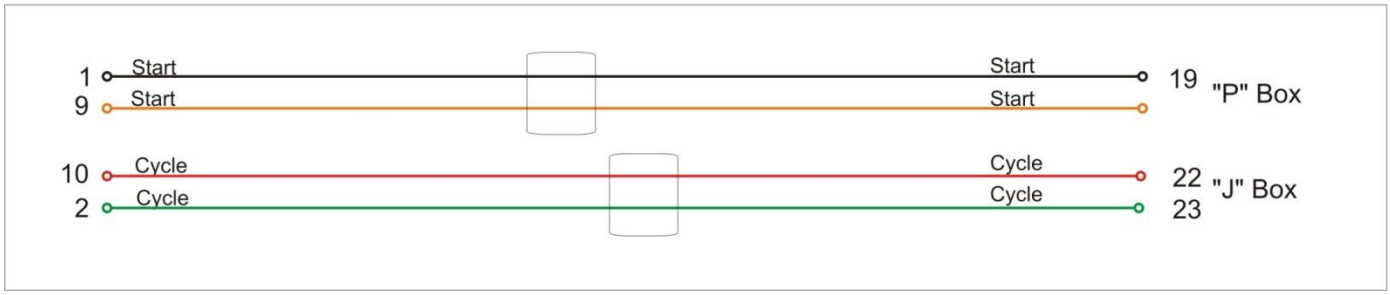


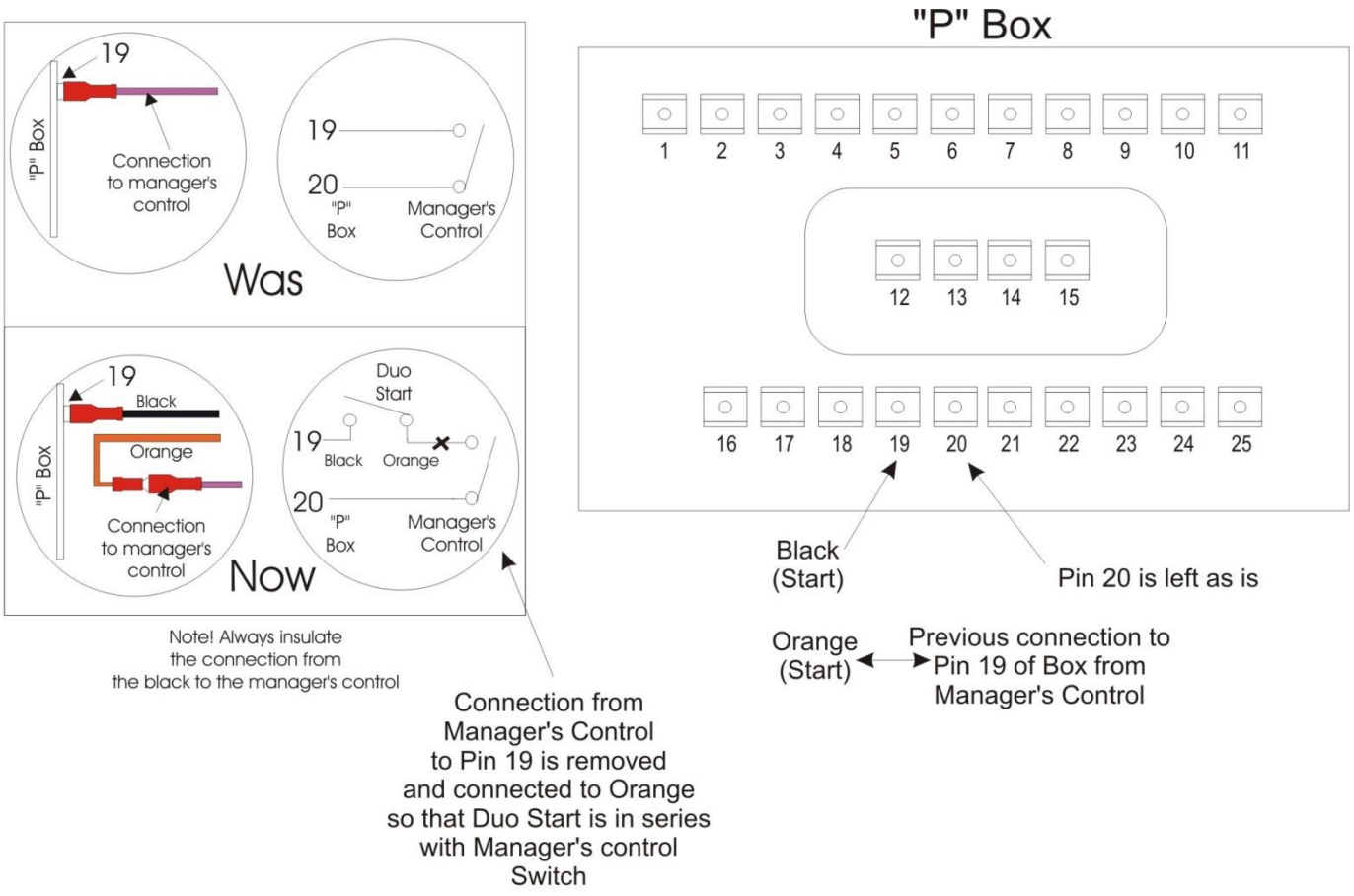
Rear View
Molex MicroFit
16 Pin
Odd & Even Lanes
are wired the same

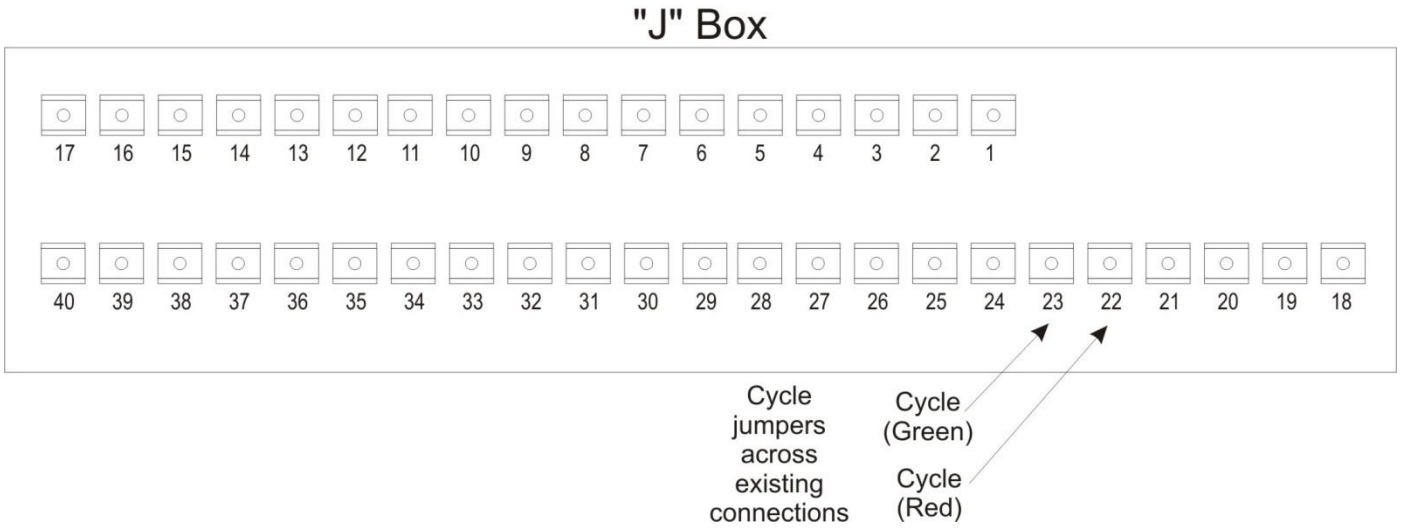
Pin	Function	Pin	Function
1	Start (Black)	9	Start (Orange)
2	Cycle (Green)	10	Cycle (Red)
3	Not Connected	11	Not Connected
4	Not Connected	12	Not Connected
5	Not Connected	13	Not Connected
6	Not Connected	14	Not Connected
7	Not Connected	15	Not Connected
8	Not Connected	16	Not Connected



AMC Connection Cable (DME-30 & DMO-30)
Odd Lane Connection
same as Even Lane




"P" Box
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15
16 17 18 19 20 21 22 23 24 25
Black (Start)
Pin 20 is left as is
Orange (Start)
Previous connection to Pin 19 of Box from Manager's Control
"P" Box
19
Connection to manager's control
19
20
"P" Box
Manager's Control
Was
19
Black
Orange
Connection to manager's control
Duo Start
19
Black
Orange
20
"P" Box
Manager's Control
Now
Note! Always insulate the connection from the black to the manager's control
Connection from Manager's Control to Pin 19 is removed and connected to Orange so that Duo Start is in series with Manager's control Switch


"J" Box
17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18
Cycle jumpers across existing connections
Cycle (Green)
Cycle (Red)

AMF 82-70

Run both the DMO-70 (Odd Lane) and DME-70 (Even Lane) cables from the Duo Camera Module, along the Ball Track, up the kickback, to the A&MC box located on the curtain wall, which is the common connection box for both lanes.

Again, the start contact is wired in series to the managers control switch on AMC Pin 5 and the cycle contact is wired in parallel across AMC pins 1 & 2 to the cycle button from the ball return. The Foul signal is also wired to the AMC box across AMC pins 7 & 8.

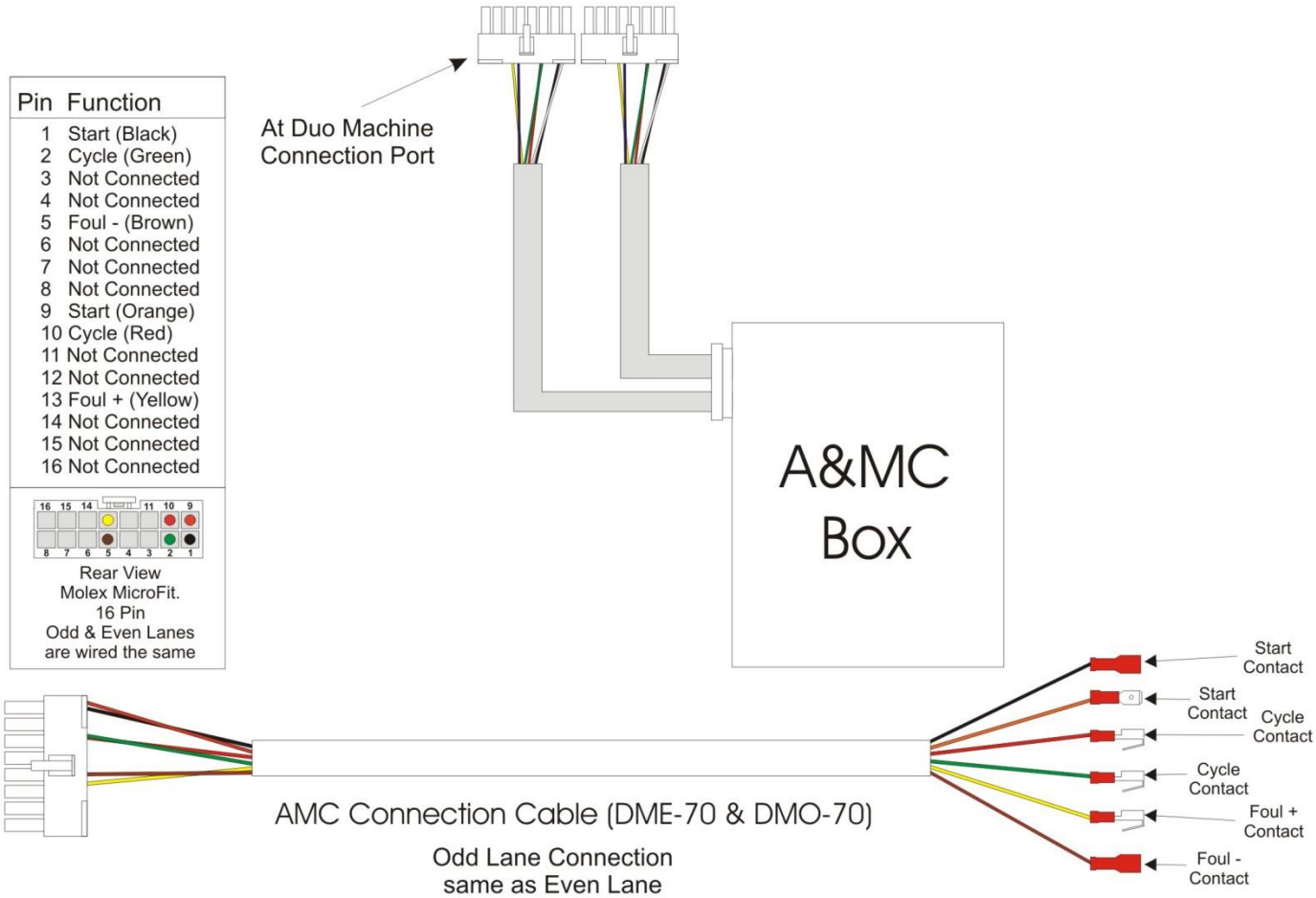
Warning: *Be careful when pulling out the existing AMC connections that you do not pull out more than the intended connector by exerting too much force. Also, make sure that no connectors are shorting out with any others, otherwise machine faults like continual cycling could occur.*

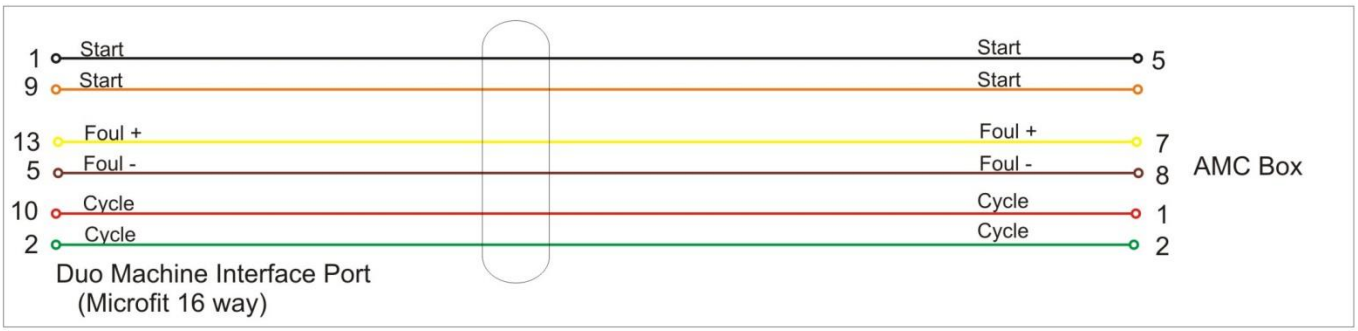
Note: *The Duo unit's start contacts must be connected in series (in line) not in parallel with (across) the manager's control switch. This is to ensure that when the manager's control switches are switched off the pinsetter will turn off. Normal operation will see the Manager's control switch turned on, the pinsetter will turn on and off with the games bowled. If, however, there is an urgent need to turn the pinsetter off it can be done quickly using the Manager's control switches.*

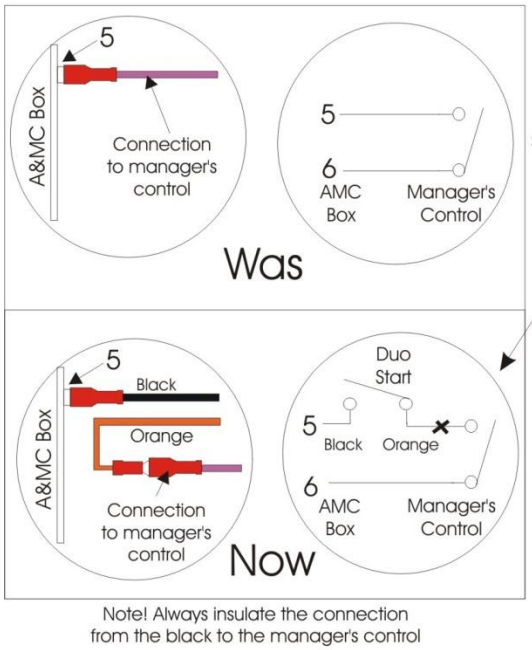
Typical AMF 82-70 Machine Connection

Pin	Function
1	Start (Black)
2	Cycle (Green)
3	Not Connected
4	Not Connected
5	Foul - (Brown)
6	Not Connected
7	Not Connected
8	Not Connected
9	Start (Orange)
10	Cycle (Red)
11	Not Connected
12	Not Connected
13	Foul + (Yellow)
14	Not Connected
15	Not Connected
16	Not Connected

Rear View
Molex MicroFit.
16 Pin
Odd & Even Lanes
are wired the same





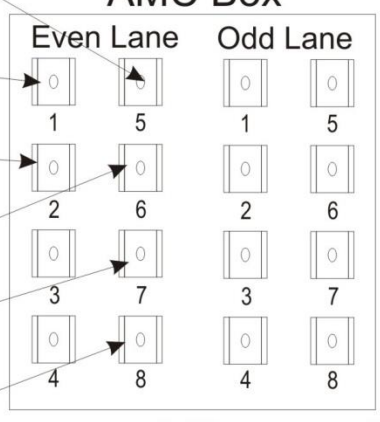


Note! Always insulate the connection
from the black to the manager's control

Connection from
Manager's Control
to Pin 5 is removed
and connected to Orange
so that Duo Start is in series
with Manager's control
Switch

Orange
(Start)
Previous connection to
Pin 5 of Box from
Manager's Control

Black
(Start)



Cycle
jumpers
across
existing
connections

Cycle
(Red)

Cycle
(Green)

Pin 6 is left as is

Foul
jumpers
across
existing
connections

Foul +
(Yellow)

Foul -
(Brown)

Odd Lane Connection
same as Even Lane

AMF 82-70 with MP Chassis

Run both the DMO-70MP (Odd Lane) and DME-70MP (Even Lane) cables from the Duo Camera Module, along the Ball Track, up the kickback.

The DMO and DME cables each consist of two cables:

A. One cable is then run to the A&MC box located on the curtain wall. Again, the start contact is wired in series to the managers control switch on AMC Pin 5.

B. The other is run to the MP chassis. The tenth frame cycle contact, foul and second ball input are included in the round APS plug that is present on the MP chassis. The APS commands also allow more advanced pinsetter functions such as short strike cycle, sweep reverse on 1st ball miss and 7 ±10 pick off.

Warning: *Be careful when pulling out the existing AMC connections that you do not pull out more than the intended connector by exerting too much force. Also, make sure that no connectors are shorting out with any others, otherwise machine faults like continual cycling could occur.*

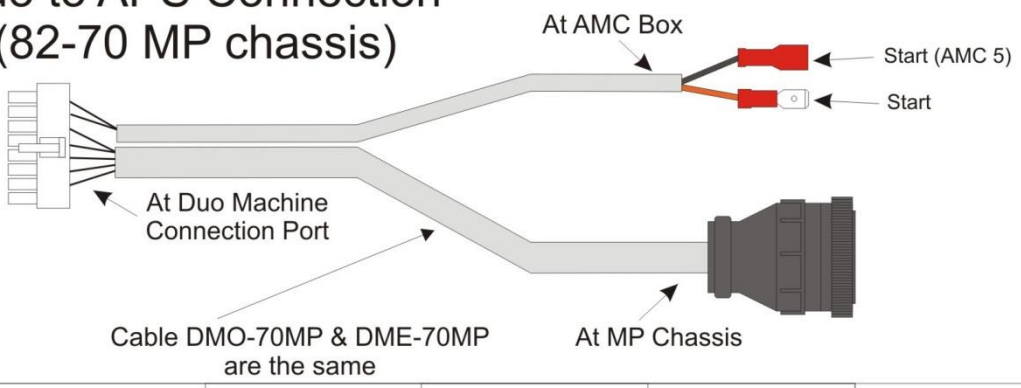
Note: *The Duo unit's start contacts must be connected in series (in line) not in parallel with (across) the manager's control switch. This is to ensure that when the manager's control switches are switched off the pinsetter will turn off. Normal operation will see the Manager's control switch turned on, the pinsetter will turn on and off with the games bowled. If, however, there is an urgent need to turn the pinsetter off it can be done quickly using the Manager's control switches.*

Important!

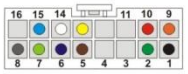
The take data delay in the **Fine Tune the Scoring Setup** *screen must be set to allow enough time for the score to be taken and the APS input to the pinspotter MP chassis to be driven prior to the pinspotter table starting to move. The default setting is 3.0 seconds for the MP chassis. The MP Chassis must receive the APS scoring input prior to the table operating, so that any advanced functions such sweep reverse can occur if necessary. If the table starts moving, it is too late for any advanced commands to be received.*

This Take Data Delay should be set as long as possible to give the maximum time for any unsteady pins to fall, but not too long so that the MP chassis times out and ignores 7-10 pick off or short strike cycles.

Duo to APS Connection (82-70 MP chassis)

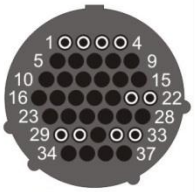


Pin	Function
1	Start (Black)
2	Cycle 1 (Green)
3	Not Connected
4	Not Connected
5	Foul - (Brown)
6	2nd Ball - (Purple)
7	APS Clk (Lt Green)
8	APS Com (Grey)
9	Start (Orange)
10	Cycle 2 (Red)
11	Not Connected
12	Not Connected
13	Foul + (Yellow)
14	2nd Ball + (White)
15	APS Data (Blue)
16	Not Connected

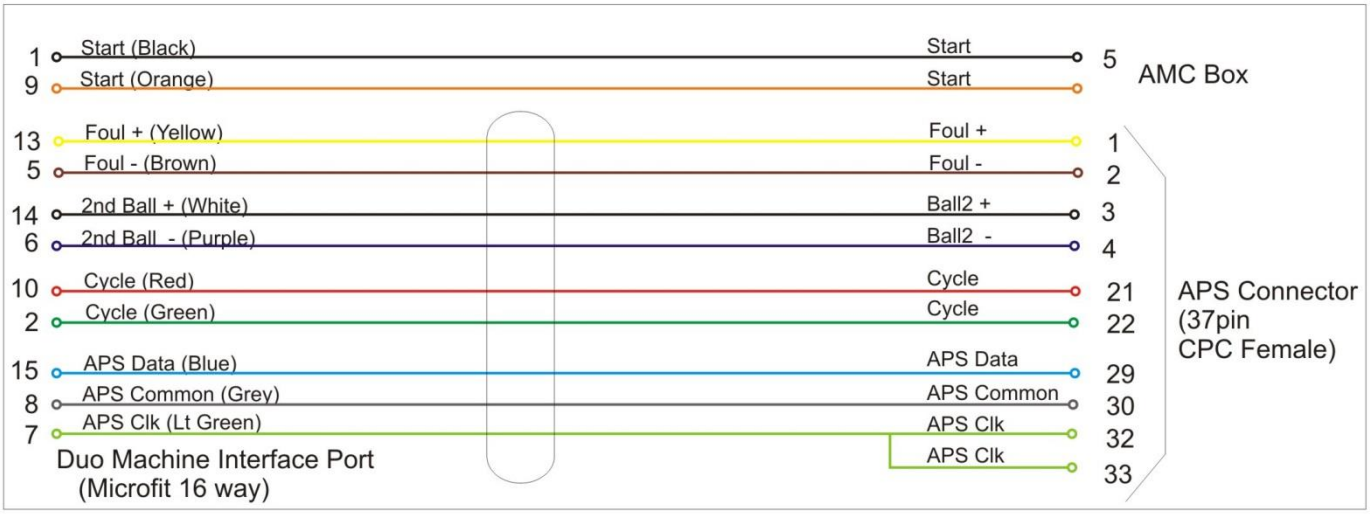


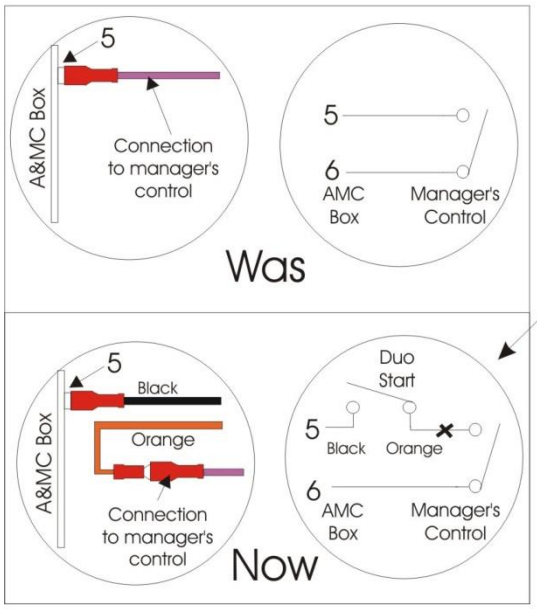
Rear View
Molex MicroFit.
16 Pin
Odd & Even Lanes
are wired the same

Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	Foul +	11	Not Connected	21	Cycle 1	31	Not Connected
2	Foul -	12	Not Connected	22	Cycle 2	32	APS Clk
3	2nd Ball +	13	Not Connected	23	Not Connected	33	APS Clk
4	2nd Ball -	14	Not Connected	24	Not Connected	34	Not Connected
5	Not Connected	15	Not Connected	25	Not Connected	35	Not Connected
6	Not Connected	16	Not Connected	26	Not Connected	36	Not Connected
7	Not Connected	17	Not Connected	27	Not Connected	37	Not Connected
8	Not Connected	18	Not Connected	28	Not Connected		
9	Not Connected	19	Not Connected	29	APS Data		
10	Not Connected	20	Not Connected	30	APS Common		



Rear View
AMP CPC
37 Pin





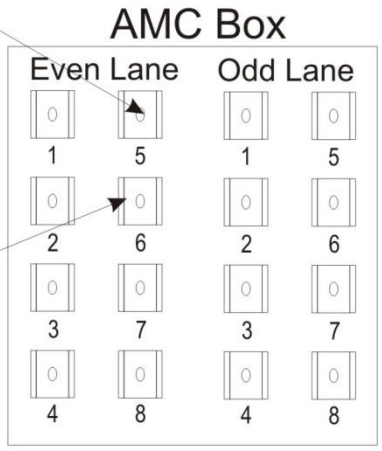
Note! Always insulate the connection from the black to the manager's control

Connection from Manager's Control to Pin 5 is removed and connected to Orange so that Duo Start is in series with Manager's control Switch

Orange (Start) ↔ Previous connection to Pin 5 of Box from Manager's Control

Black (Start)

Pin 6 is left as is



Odd Lane Connection same as Even Lane

AMF 82-70 with MK Expander

Run both the DMO-70MK and DME-70MK cables from the Duo Camera Module, along the Ball Track, up the kickback.

The DMO & DME cables each consist of three separate cables:

A. The First cable is run to the A&MC box located on the curtain wall. Again, the start contact is wired in series to the managers control switch on AMC Pin 5 and the cycle contact is wired in parallel across AMC pins 1 & 2 to the cycle button from the ball return. The Foul signal is also wired to the AMC box across AMC pins 7 & 8.

Warning: *Be careful when pulling out the existing AMC connections that you do not pull out more than the intended connector by exerting too much force. Also, make sure that no connectors are shorting out with any others, otherwise machine faults like continual cycling could occur.*

Note: *The Duo unit's start contacts must be connected in series (in line) not in parallel with (across) the manager's control switch. This is to ensure that when the manager's control switches are switched off the pinsetter will turn off. Normal operation will see the Manager's control switch turned on, the pinsetter will turn on and off with the games bowled. If, however, there is an urgent need to turn the pinsetter off it can be done quickly using the Manager's control switches.*

B. The second cable is run to the MK Expander PC Board in the control chassis, where the four-pin connector is plugged into the top right corner of the Printed Circuit Board. The APS commands allow more advanced pinsetter functions such as short strike cycle, sweep reverse on 1st ball miss and 7 ±10 pick off.

C. The third cable is run to the masking unit, where it is connected across the 2nd Ball light. Check the polarity of the connection by making sure that the 2nd Ball Indicator on the Duo Camera unit comes on when the pinsetter is on second ball.

Important!

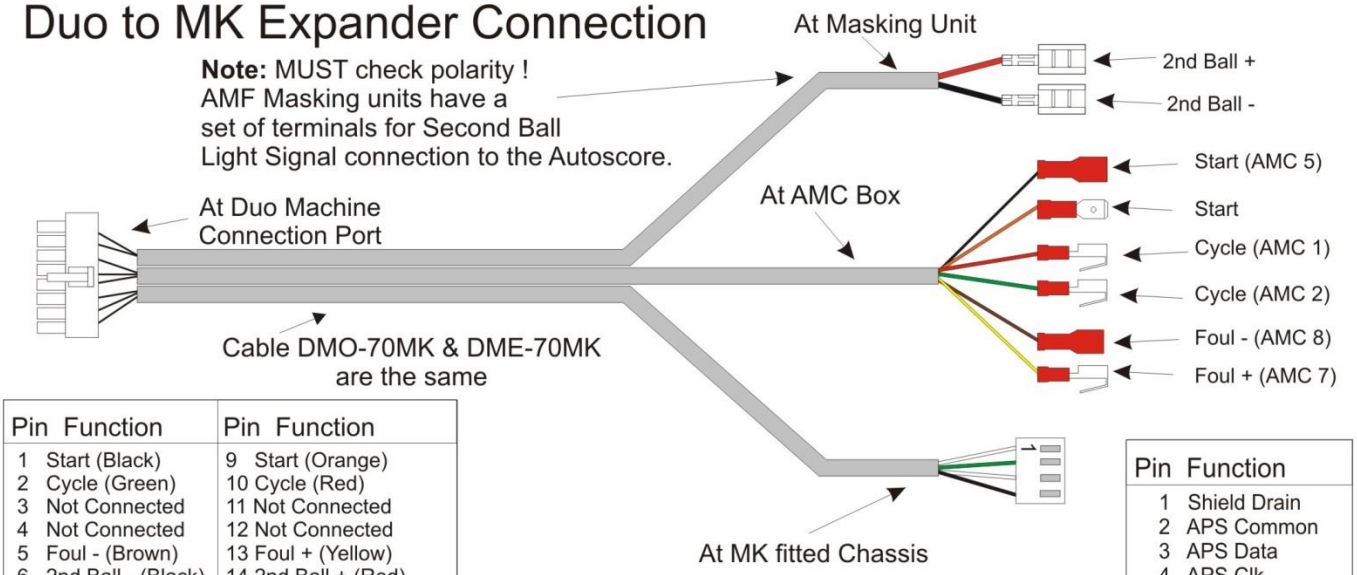
The take data delay in the **Fine Tune the Scoring Setup** *screen must be set to a allow enough time for the score to be taken and the APS input to the MK expander chassis to be driven prior to the pinspotter table starting to move. The default setting is 3.0 seconds for the Omega-Tek chassis fitted with MK expanders. The MK expander must receive the APS scoring input prior to the table operating, so that any advanced functions such sweep reverse can occur if necessary. If the table starts moving, it is too late for any advanced commands to be received.*

This Take Data Delay should be set as long as possible to give the maximum time for any unsteady pins to fall, but not too long so that the MK expander times out and ignores 7-10 pick off or short strike cycles.

Note: *Make sure that the Pinsetter Model Type in the Setup Wizard is set to* ***AMF 82_70MP****. The MP Chassis and the MK Expander behave in the same way, so the one Pinsetter Model Type will operate both types of chassis.*

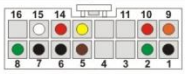
Tip: Some pinspotters have the MK expander fitted, but have not been re-wired to enable reversing of the sweep motor. It is possible to enable or disable the sweep reverse function for the APS in the **Check Pinsetter Connections** screen in the troubleshooting menu of the Duo.

Duo to MK Expander Connection

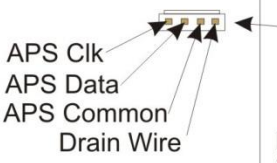


Note: MUST check polarity ! AMF Masking units have a set of terminals for Second Ball Light Signal connection to the Autoscore.

Pin	Function	Pin	Function
1	Start (Black)	9	Start (Orange)
2	Cycle (Green)	10	Cycle (Red)
3	Not Connected	11	Not Connected
4	Not Connected	12	Not Connected
5	Foul - (Brown)	13	Foul + (Yellow)
6	2nd Ball - (Black)	14	2nd Ball + (Red)
7	APS Clk (Black)	15	APS Data (White)
8	APS Com (Green)	16	Ball2 AMF Accuscore



Rear View
Molex MicroFit
16 Pin
Odd & Even Lanes
are wired the same

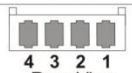


Mk Expander PCB

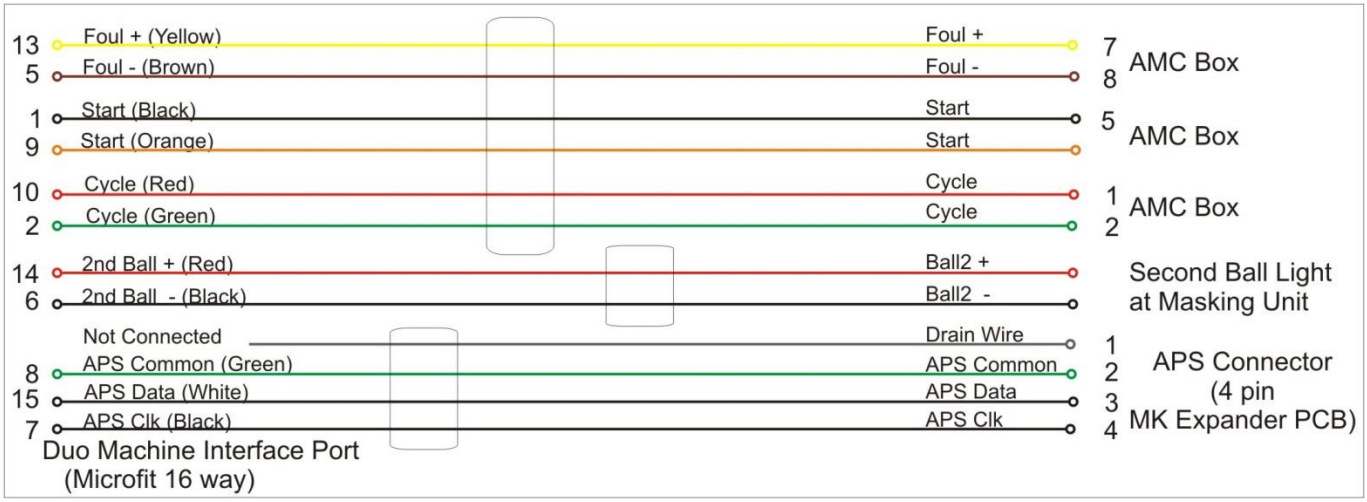
APS Plug (located at top right of MK Expander PCB)

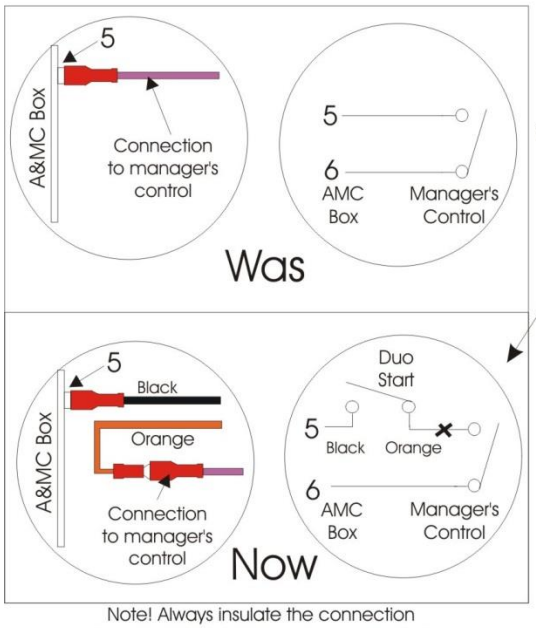
LED on MK expander will illuminate when APS connection is made

Pin	Function
1	Shield Drain
2	APS Common
3	APS Data
4	APS Clk



Rear View
Molex KK Connector
4 Pin
Odd & Even Lanes
are wired the same





Note! Always insulate the connection from the black to the manager's control

Connection from Manager's Control to Pin 5 is removed and connected to Orange so that Duo Start is in series with Manager's control Switch

Orange (Start) ↔ Previous connection to Pin 5 of Box from Manager's Control

Black (Start)

Cycle jumpers across existing connections

Cycle (Red)

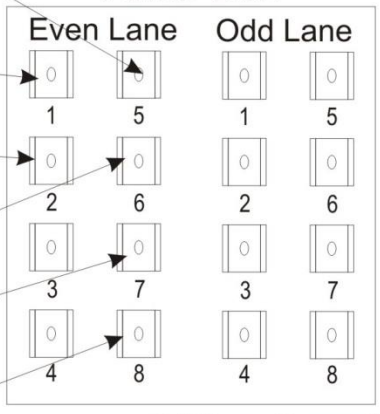
Cycle (Green)

Pin 6 is left as is

Foul jumpers across existing connections

Foul + (Yellow)

Foul - (Brown)



Odd Lane Connection same as Even Lane

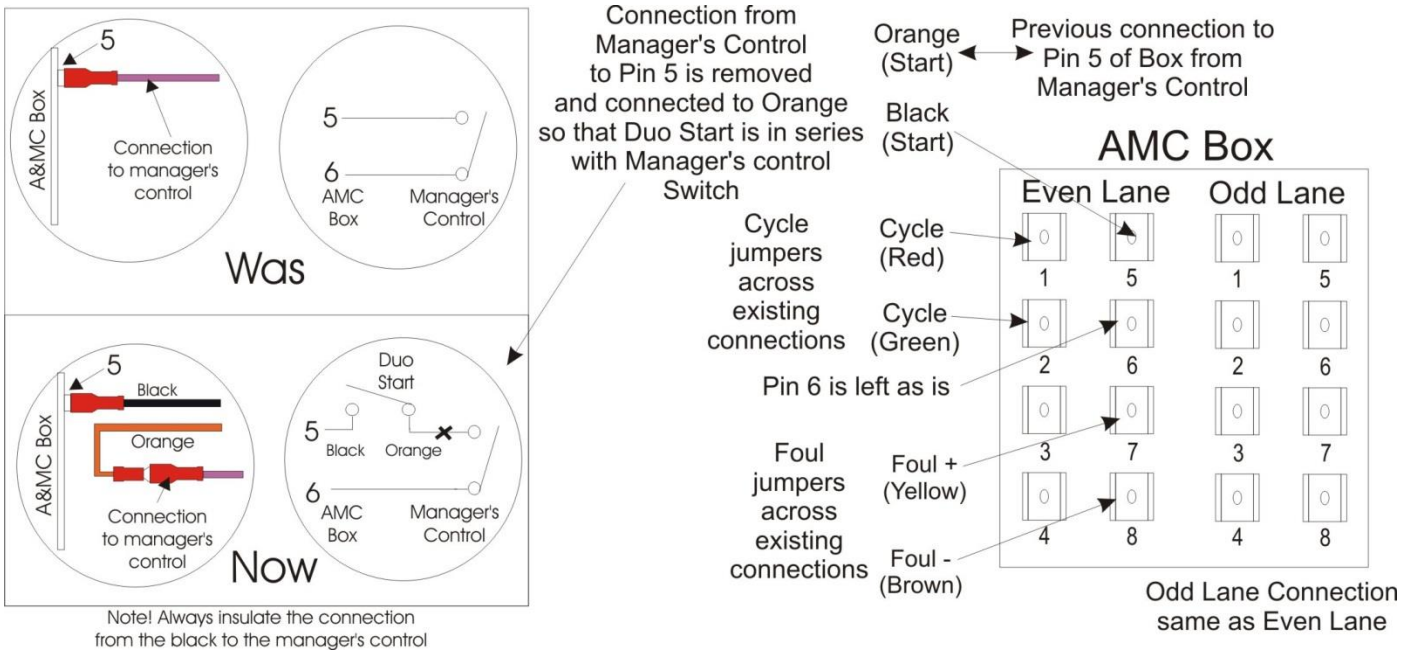
AMF 82-70 with XOP Chassis

Run both the DMO-70XOP and DME-70XOP cables from the Duo Camera Module, along the Ball Track, up the kickback, to a location near the A&MC Box.

The DMO & DME cables then each consist of three separate cables:

A. The First cable is run to the A&MC box located on the curtain wall. Again, the start contact is wired in series to the managers control switch on AMC Pin 5 and the cycle contact is wired in parallel across AMC pins 1 & 2 to the cycle button from the ball return. The Foul signal is also wired to the AMC box across AMC pins 7 & 8.

Note: *The Duo unit's start contacts must be connected in series (in line) not in parallel with (across) the manager's control switch. This is to ensure that when the manager's control switches are switched off the pinsetter will turn off. Normal operation will see the Manager's control switch turned on, the pinsetter will turn on and off with the games bowled. If, however, there is an urgent need to turn the pinsetter off it can be done quickly using the Manager's control switches.*



B. The second cable is run to the XOP control chassis, where the existing cable to the old Accuscore system is cut and a four pin connector is fitted, as per the diagram below. This allows APS commands to be passed from the Duo units to the XOP chassis. The APS commands allow more advanced pinsetter functions such as short strike cycle, sweep reverse on 1st ball miss and 7 ±10 pick off.

C. The third cable is run to the masking unit, where it is connected across the 2nd Ball light. Check the polarity of the connection by making sure that the 2nd Ball Indicator on the Duo Camera unit comes on when the pinsetter is on second ball.

Important!

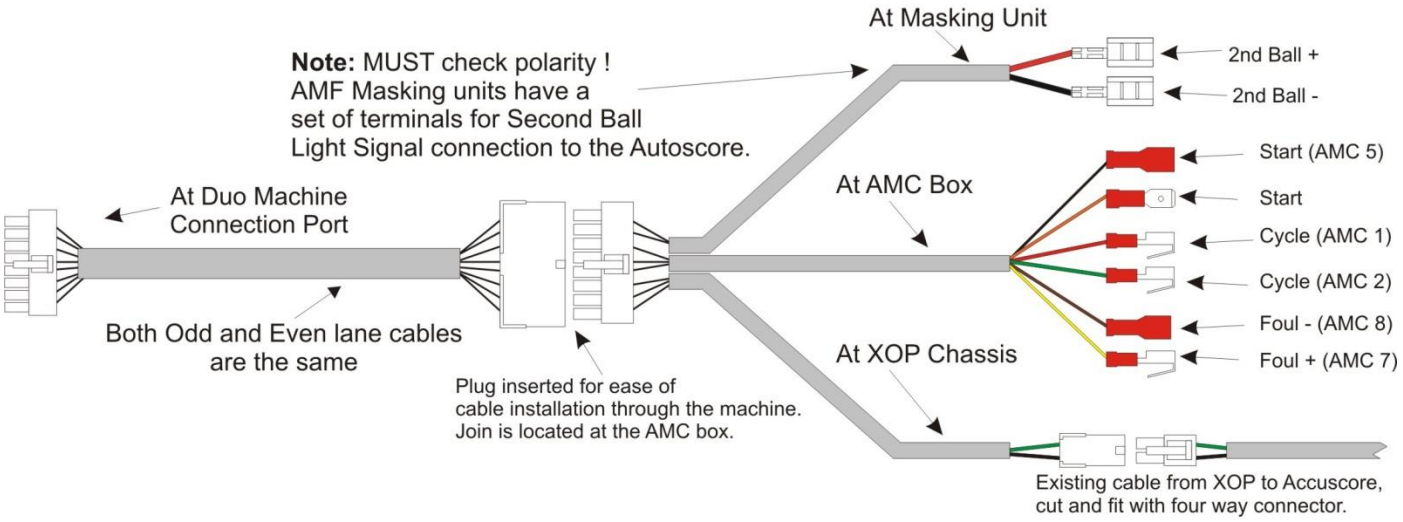
The take data delay in the **Fine Tune the Scoring Setup** *screen must be set to a allow enough time for the score to be taken and the APS input to the XOP chassis to be driven prior to the pinspotter table starting to move. The default setting is 3.0 seconds. The XOP Chassis must receive the APS scoring input prior to the table operating, so that any advanced functions such sweep reverse can occur if necessary. If the table starts moving, it is too late for any advanced commands to be received.*

This Take Data Delay should be set as long as possible to give the maximum time for any unsteady pins to fall, but not too long so that the MK expander times out and ignores 7-10 pick off or short strike cycles.

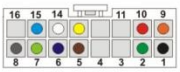
Note: *Make sure that the Pinsetter Model Type in the Setup Wizard is set to* ***AMF 82_70MP****. The MP Chassis and the XOP Chassis behave in the same way, so the one Pinsetter Model Type will operate both types of chassis.*

Tip: *Some pinspotters have the XOP chassis fitted, but have not been re-wired to enable reversing of the sweep motor. It is possible to enable or disable the sweep reverse function for the APS in the* ***Check Pinsetter Connections*** *screen in the troubleshooting menu of the Duo.*

Duo to XOP Connection

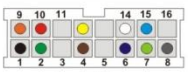

At Masking Unit
Note: MUST check polarity !
AMF Masking units have a
set of terminals for Second Ball
Light Signal connection to the Autoscore.
2nd Ball +
2nd Ball -
At Duo Machine
Connection Port
At AMC Box
Start (AMC 5)
Start
Cycle (AMC 1)
Cycle (AMC 2)
Foul - (AMC 8)
Foul + (AMC 7)
Both Odd and Even lane cables
are the same
At XOP Chassis
Plug inserted for ease of
cable installation through the machine.
Join is located at the AMC box.
Existing cable from XOP to Accuscore,
cut and fit with four way connector.

Pin	Function
1	Start (Black)
2	Cycle (Green)
3	Not Connected
4	Not Connected
5	Foul - (Brown)
6	2nd Ball - (Purple)
7	APS Clk (Lt Green)
8	APS Com (Grey)
9	Start (Orange)
10	Cycle (Red)
11	Not Connected
12	Not Connected
13	Foul + (Yellow)
14	2nd Ball + (White)
15	APS Data (Blue)
16	Not Connected



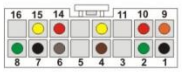
Rear View
Male Molex MicroFit
16 Pin
Odd & Even Lanes
are wired the same

Pin	Function
1	Start (Black)
2	Cycle (Green)
3	Not Connected
4	Foul - (Brown)
5	Not Connected
6	2nd Ball - (Purple)
7	APS Clk (Lt Green)
8	APS Com (Grey
9	Start (Orange)
10	Cycle (Red)
11	Not Connected
12	Foul + (Yellow)
13	Not Connected
14	2nd Ball + (White)
15	APS Data (Blue)
16	Not Connected)



Rear View
Female Molex Mini Fit Jnr
16 Pin
Odd & Even Lanes
are wired the same

Pin	Function
1	Start (Black)
2	Cycle (Green)
3	Not Connected
4	Foul - (Brown)
5	Not Connected
6	2nd Ball - (Black)
7	APS Clk (Black)
8	APS Com (Green)
9	Start (Orange)
10	Cycle (Red)
11	Not Connected
12	Foul + (Yellow)
13	Not Connected
14	2nd Ball + (Red)
15	APS Data (Yellow)
16	Not Connected



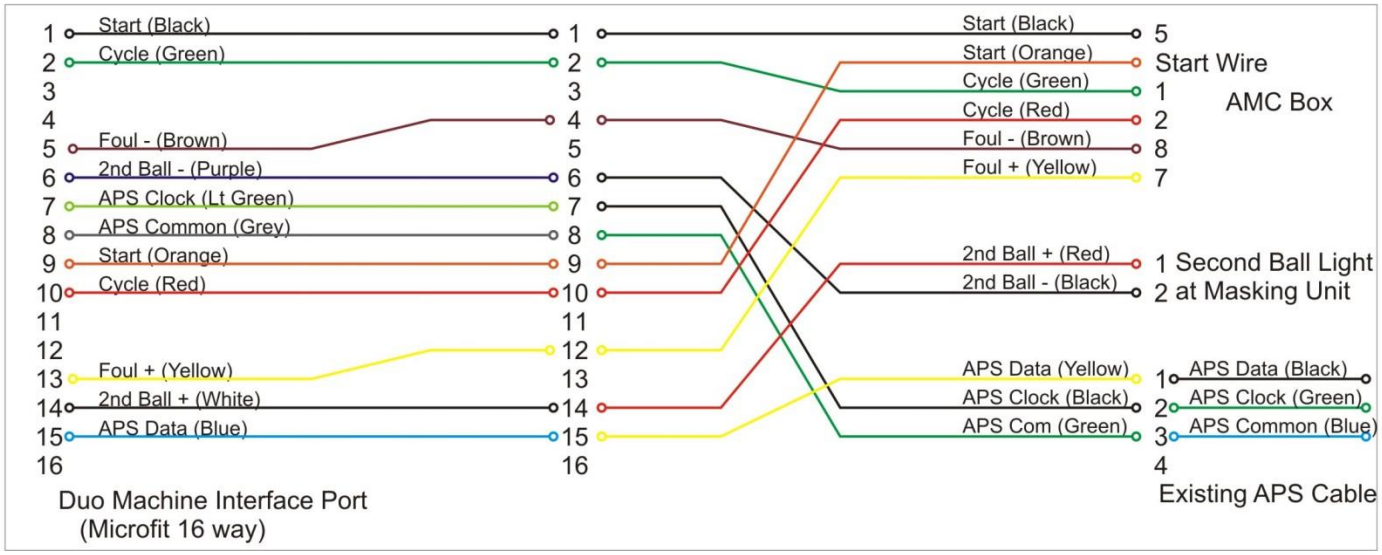
Rear View
Male Molex Mini Fit Jnr
16 Pin
Odd & Even Lanes
are wired the same

Pin	Function
1	APS Data (Yellow)
2	APS Clk (Black)
3	APS Com (Green)
4	Not Connected

Rear View
Male Molex MiniFit Jnr
4 Pin
Odd & Even Lanes
are wired the same

Pin	Function
1	APS Data (Black)
2	APS Clk (Green)
3	APS Com (Blue)
4	Not Connected

Rear View
Female Molex MiniFit Jnr
4 Pin
Odd & Even Lanes
are wired the same



AMF 82-90 (Large Chassis)

As the AMF 82-90 machine uses the same common chassis to control both the Odd and Even machines, the Duo Camera module only uses one cable to connect to this model of Pinsetter.

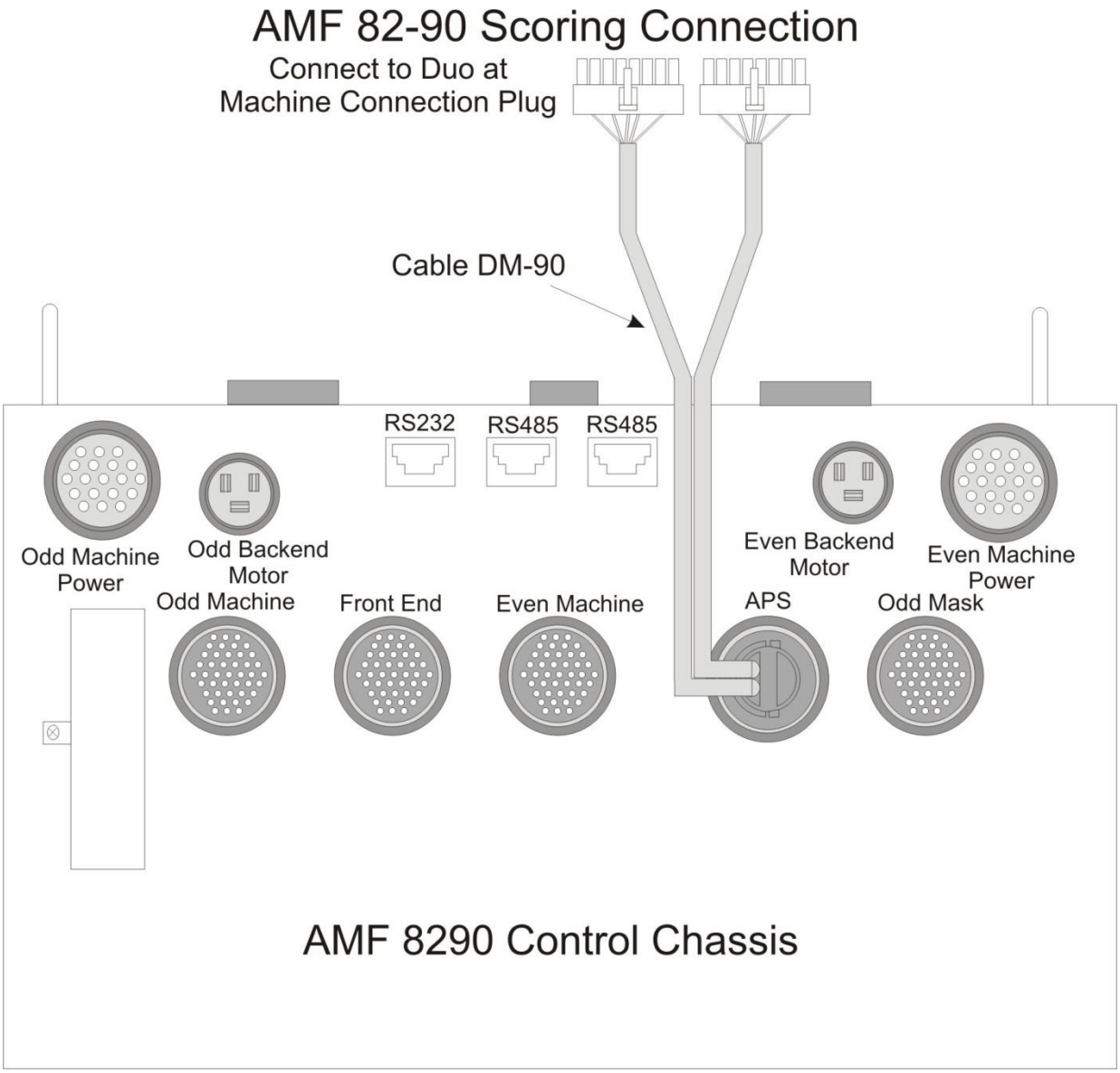
Run the DM-90 cable from the Duo Hardware Module, along the Ball Track, up the kickback, to the 82-90 chassis at the rear of the Pinsetter, and plug into the APS connection at the back of the chassis. The DM-90 cable gives the Duo Camera Module signals for Cycle, Foul, Rake Down and Pinsetter Status.

However, it DOES NOT contain signals to turn the Pinsetter On and Off from the Duo unit. To enable this optional feature, the optional Lane Control Computers must be connected to the MCU (Managers Control Unit) and software run to enable the MCU commands to be sent from the computer to the Pinsetter, via the MCU.

For more information on connecting the MCU to the Lane Control Computers, see Appendix C in this manual.

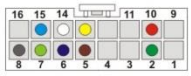
Note: *The take data delay in the* **Fine Tune the Scoring Setup** *screen must be set to a allow enough time for the score to be taken and the APS input to the 82-90 chassis to be driven prior to the pinspotter table starting to move. The default setting is 3.0 seconds for the 82-90 pinsetter model type. The 82-90 must receive the APS scoring input prior to the table operating, so that any advanced functions such sweep reverse can occur if necessary. If the table starts moving, it is too late for any advanced commands to be received.*

This Take Data Delay should be set as long as possible to give the maximum time for any unsteady pins to fall, but not too long so that the 82-90 chassis times out and ignores 7-10 pick off or short strike cycles

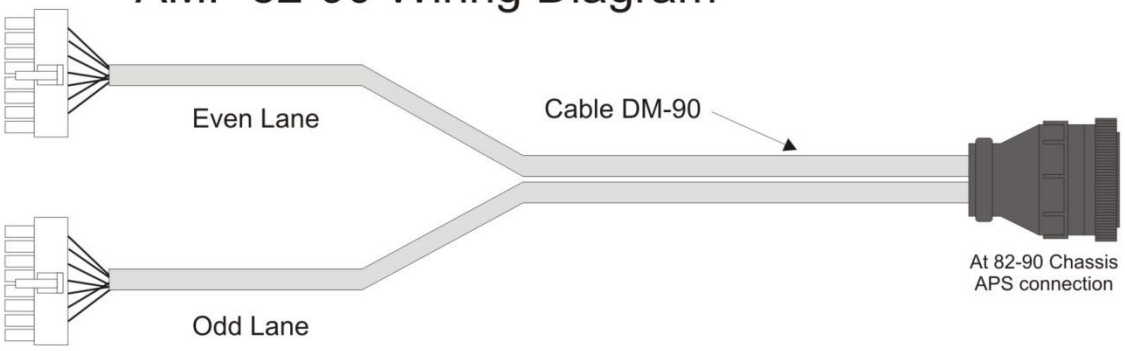


AMF 82-90 Wiring Diagram

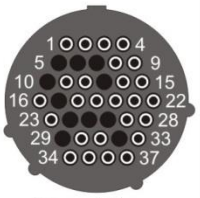
Pin	Function
1	Not Connected
2	Cycle 1 (Green)
3	Not Connected
4	Not Connected
5	Foul - (Brown)
6	2nd Ball - (Purple)
7	APS Clk (Lt Green)
8	APS Com (Grey)
9	Not Connected
10	Cycle 2 (Red)
11	Not Connected
12	Not Connected
13	Foul + (Yellow)
14	2nd Ball + (White)
15	APS Data (Blue)
16	Not Connected



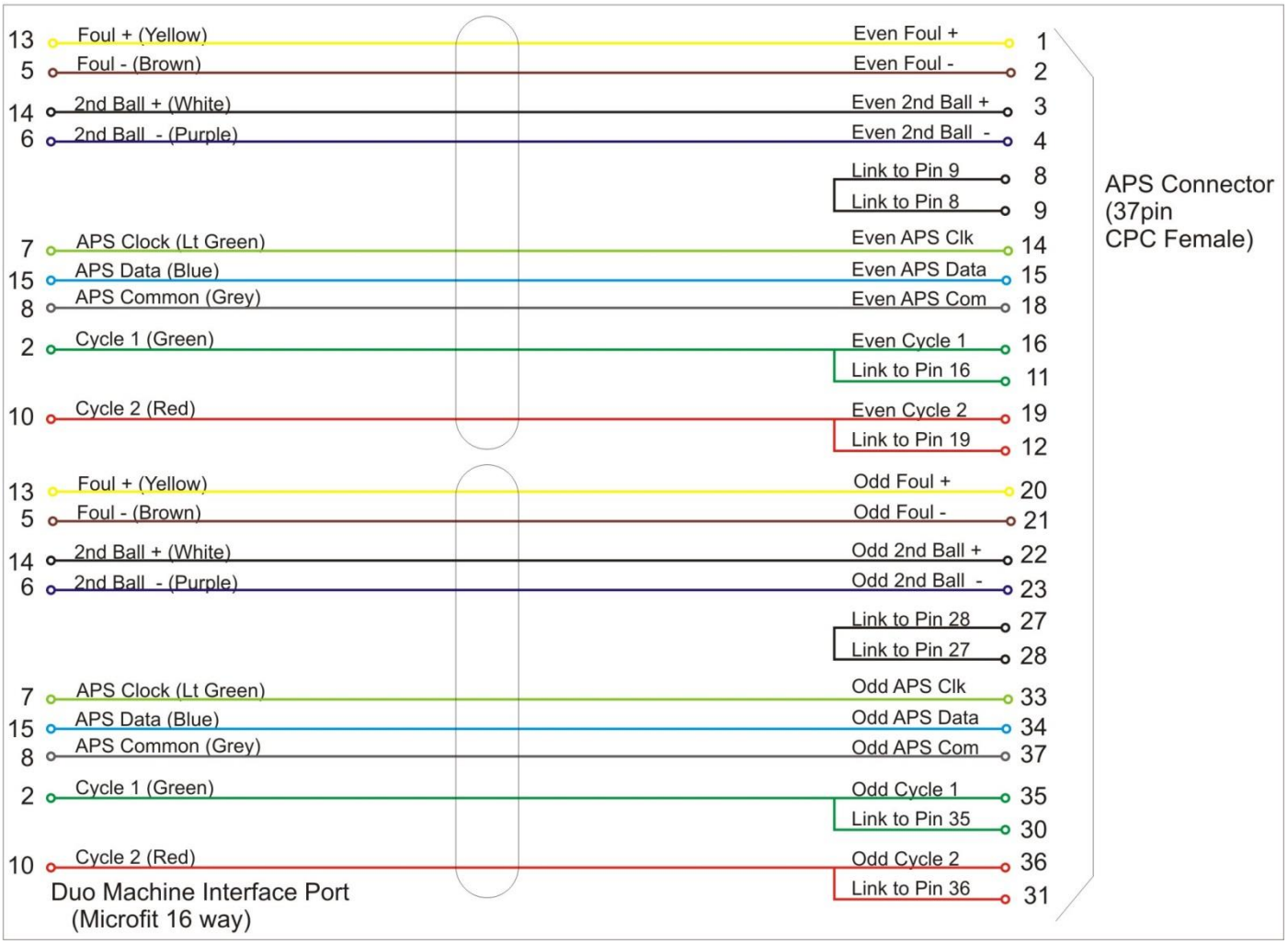
Rear View
Molex MicroFit.
16 Pin
Odd & Even Lanes
are wired the same



Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	Even Foul +	11	Linked to Pin 16	21	Odd Foul -	31	Linked to Pin 36
2	Even Foul -	12	Linked to Pin 19	22	Odd 2nd Ball +	32	Not Connected
3	Even 2nd Ball +	13	Not Connected	23	Odd 2nd Ball -	33	Odd APS Clk
4	Even 2nd Ball -	14	Even APS Clk	24	Not Connected	34	Odd APS Data
5	Not Connected	15	Even APS Data	25	Not Connected	35	Odd Cycle 1
6	Not Connected	16	Even Cycle 1	26	Not Connected	36	Odd Cycle 2
7	Not Connected	17	Not Connected	27	Linked to Pin 28	37	Odd APS Com
8	Linked to Pin 9	18	Even APS Com	28	Linked to Pin 27		
9	Linked to Pin 8	19	Even Cycle 2	29	Not Connected		
10	Not Connected	20	Odd Foul +	30	Linked to Pin 35		



Rear View
AMP CPC
37 Pin


13 Foul + (Yellow)
5 Foul - (Brown)
14 2nd Ball + (White)
6 2nd Ball - (Purple)
7 APS Clock (Lt Green)
15 APS Data (Blue)
8 APS Common (Grey)
2 Cycle 1 (Green)
10 Cycle 2 (Red)
13 Foul + (Yellow)
5 Foul - (Brown)
14 2nd Ball + (White)
6 2nd Ball - (Purple)
7 APS Clock (Lt Green)
15 APS Data (Blue)
8 APS Common (Grey)
2 Cycle 1 (Green)
10 Cycle 2 (Red)
Duo Machine Interface Port
(Microfit 16 way)
Even Foul + 1
Even Foul - 2
Even 2nd Ball + 3
Even 2nd Ball - 4
Link to Pin 9 8
Link to Pin 8 9
Even APS Clk 14
Even APS Data 15
Even APS Com 18
Even Cycle 1 16
Link to Pin 16 11
Even Cycle 2 19
Link to Pin 19 12
Odd Foul + 20
Odd Foul - 21
Odd 2nd Ball + 22
Odd 2nd Ball - 23
Link to Pin 28 27
Link to Pin 27 28
Odd APS Clk 33
Odd APS Data 34
Odd APS Com 37
Odd Cycle 1 35
Link to Pin 35 30
Odd Cycle 2 36
Link to Pin 36 31
APS Connector
(37pin
CPC Female)

Xima Pinsetter

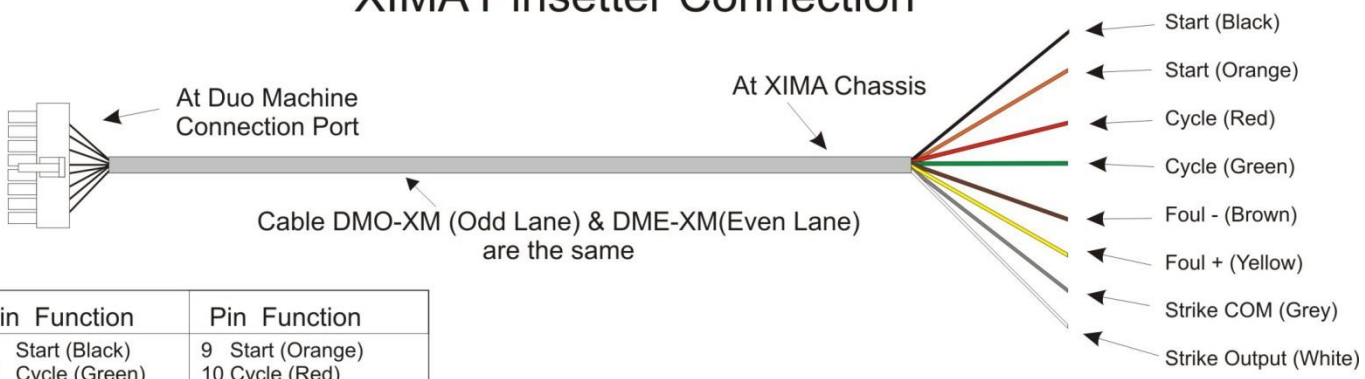
Run both the DMO-XM (Odd Lane) and DME-XM (Even Lane) cables from the Duo Camera Module, along the Ball Track, up the kickback, and then up to the Control box on the Odd and Even lanes respectively. Make sure you route all cables away from moving parts, so there is no chance of the cables being crushed or cut.

The start contacts are connected in series to the managers control switch and the cycle contact is wired in parallel to the cycle button from the ball return.

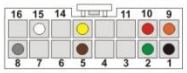
See your Xima reference material to determine for more information on where to connect into the Xima Control chassis.

Note: *The Duo unit's start contacts must be connected in series (in line) not in parallel with (across) the manager's control switch. This is to ensure that when the manager's control switches are switched off the pinsetter will turn off. Normal operation will see the Manager's control switch turned on, the pinsetter will turn on and off with the games bowled. If, however, there is an urgent need to turn the pinsetter off it can be done quickly using the Manager's control switches.*

XIMA Pinsetter Connection

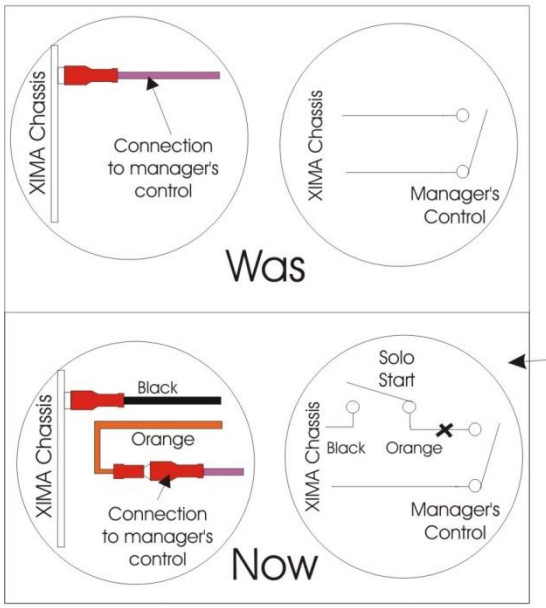


Pin	Function	Pin	Function
1	Start (Black)	9	Start (Orange)
2	Cycle (Green)	10	Cycle (Red)
3	Not Connected	11	Not Connected
4	Not Connected	12	Not Connected
5	Foul - (Brown)	13	Foul + (Yellow)
6	Not Connected	14	Not Connected
7	Not Connected	15	Strike Output (White)
8	Strike Com (Grey)	16	Not Connected



Rear View
Molex MicroFit
16 Pin
Odd & Even Lanes
are wired the same

13 Foul + (Yellow) Foul +
5 Foul - (Brown) Foul -
9 Start (Orange) Start
1 Start (Black) Start
10 Cycle (Red) Cycle
2 Cycle (Green) Cycle
15 Strike Output (White) Strike Output
8 Strike Common (Grey) Strike Common
Duo Machine Connection Port
(Microfit 16 way)
Connect to XIMA chassis



Connection from Manager's Control switch to XIMA chassis is removed and connected to Orange so that Duo Start is in series with Manager's control Switch

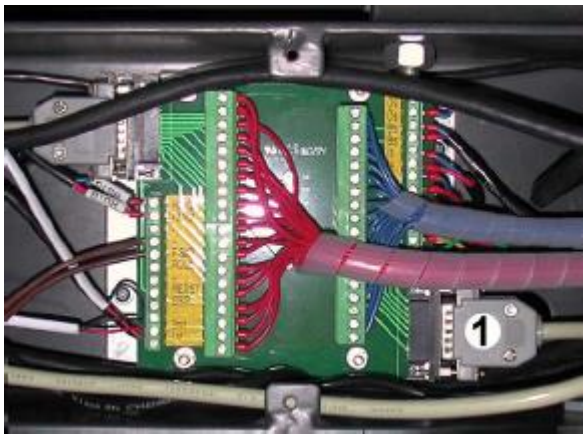
Note! Always insulate the connection from the black to the manager's control

VIA Pinsetter

Run both the DMO-VIA (Odd Lane) and DME-VIA (Even Lane) cables from the Duo Camera Module, along the Ball Track, up the kickback, and then up to the cable tray at the front of the Odd and Even lanes respectively. Make sure you route all cables away from moving parts, so there is no chance of the cables being crushed or cut.

All connections go to a single 15 pin plug on the MC2 Scoring Interface board, located in the cable tray.

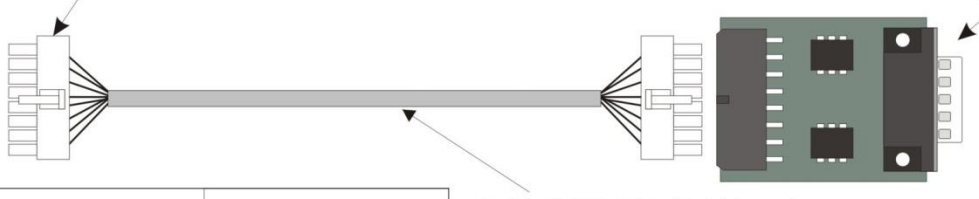
See your VIA reference material to determine for more information on the location and connection to the MC2 Scoring Interface Board.



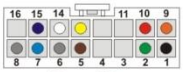
1= Scoring Interface Connector DB15 Male

Note: *In order for the Duo system to operate with the VIA pinsetter, you MUST set the machine type to XIMA in Step 2 of the lane setup wizard. This is because the XIMA and the VIA pinsetters operate in a very similar manner, with only the electronics being the major difference.*

VIA Pinsetter Connection



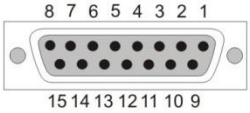
Pin	Function	Pin	Function
1	Pinsetter On (Black)	9	Pinsetter On (Orange)
2	Cycle (Green)	10	Cycle (Red)
3	Not Connected	11	Not Connected
4	Not Connected	12	Not Connected
5	Foul - (Brown)	13	Foul + (Yellow)
6	2nd Ball - (Grey)	14	2nd Ball + (White)
7	Gutter (Light Blue)	15	Strike Output (Blue)
8	Common (Grey)	16	Not Connected



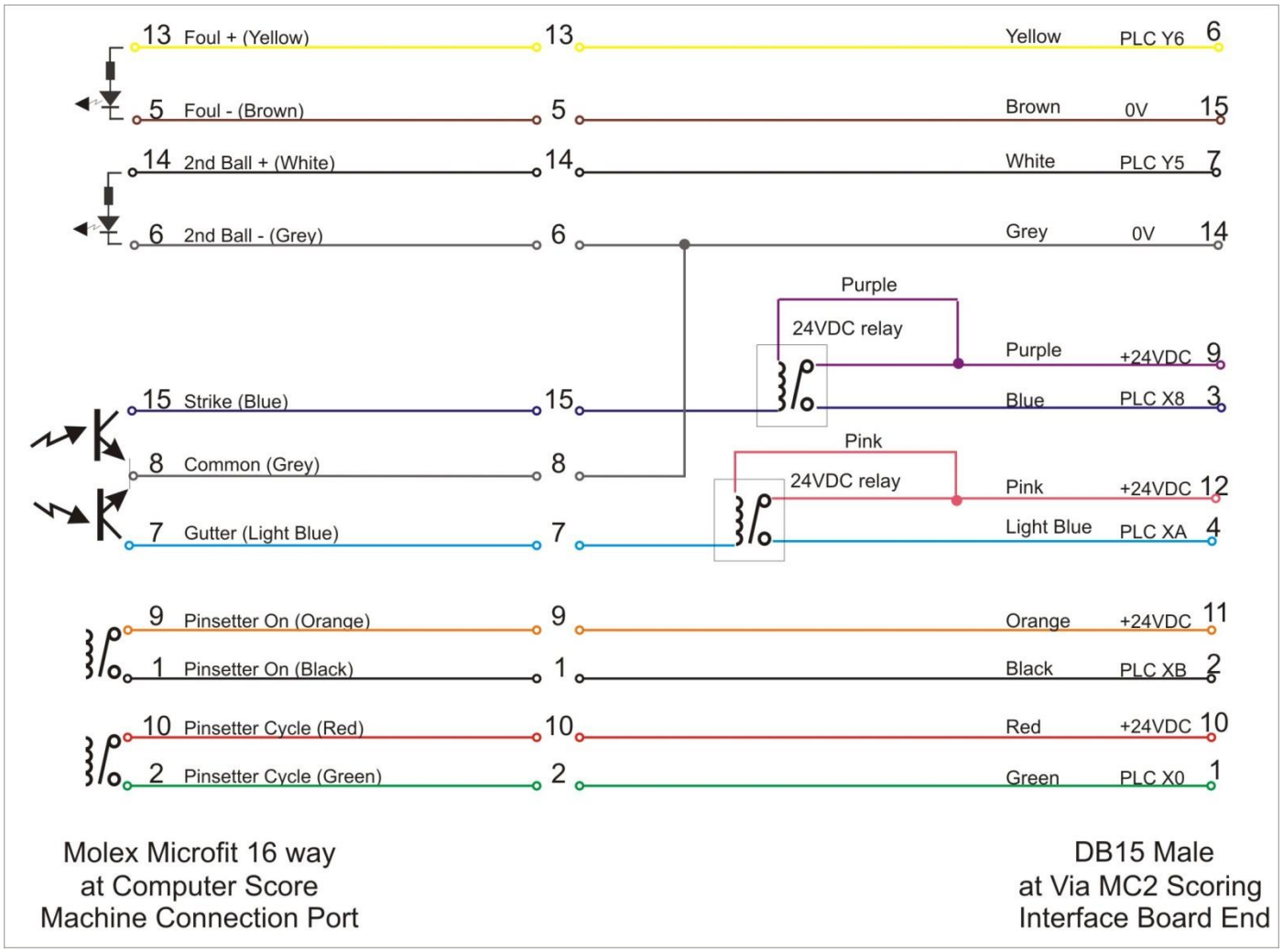
Rear View
Molex MicroFit
16 Pin
Odd & Even Lanes
are wired the same

Cable DMO-VIA (Odd Lane)
& DME-VIA(Even Lane)
are the same

Pin	Function
1	PLC XO (Green)
2	PLC XB (Black)
3	PLC X8 (Blue)
4	PLC XA (Light BLue)
5	Not Connected
6	PLC Y6 (Yellow)
7	PLC Y5 (White)
8	Not Connected
9	+24VDC (Purple)
10	+24VDC (Red)
11	+24VDC (Orange)
12	+24VDC (Pink)
13	Not Connected
14	OV (Grey)
15	OV (Brown)



Rear View
DB15 Male
15 Pin



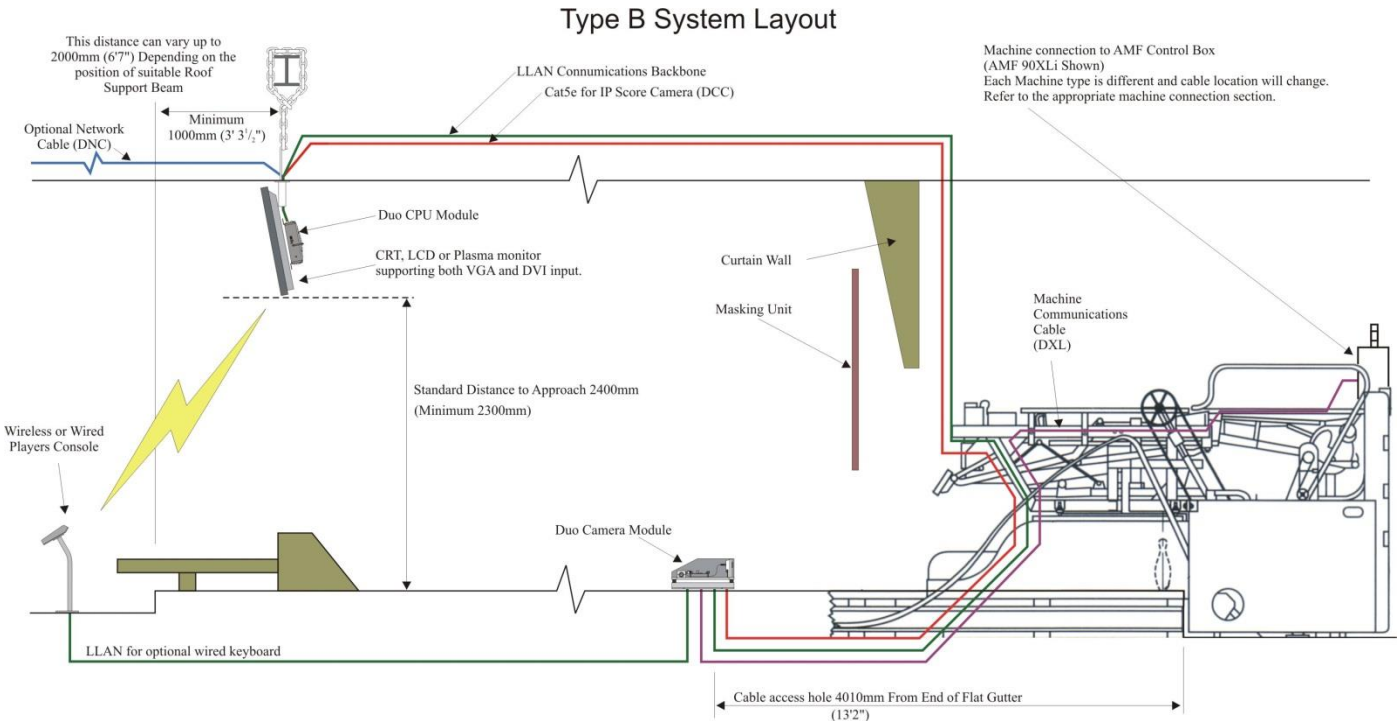
Molex Microfit 16 way
at Computer Score
Machine Connection Port

DB15 Male
at Via MC2 Scoring
Interface Board End

Type B Systems

For each pair of lanes in a standard Type B installation there are four communications cables:

1. LLAN This cable runs from the Duo CPU module to the Duo Camera module. Another LLAN cable is then run from the Duo Camera m R G X O H W R W K H R S W L R Q D O Z L U H G F R Q Q Keypad. This cable supplies both power and communications.
2. DCC This cable runs from the Duo CPU module to the Duo Camera module. This cable supplies power and video signal to the camera.
3. DNC This optional cable runs from the Duo CPU module to a network switch in order to gain communications to the Center Command front desk software.
4. DXL This cable runs from the Duo Camera module to the Pinsetter Control Chassis for the pair of lanes. The location and name of the plug varies from model to model. Please refer to the Machine Connection section below for more information.


Type B System Layout
This distance can vary up to 2000mm (6'7") Depending on the position of suitable Roof Support Beam
Minimum 1000mm (3' 3 1/2")
Optional Network Cable (DNC)
LLAN Connumications Backbone
Cat5e for IP Score Camera (DCC)
Machine connection to AMF Control Box (AMF 90XLi Shown)
Each Machine type is different and cable location will change.
Refer to the appropriate machine connection section.
Duo CPU Module
CRT, LCD or Plasma monitor supporting both VGA and DVI input.
Curtain Wall
Masking Unit
Machine Communications Cable (DXL)
Standard Distance to Approach 2400mm (Minimum 2300mm)
Wireless or Wired Players Console
Duo Camera Module
LLAN for optional wired keyboard
Cable access hole 4010mm From End of Flat Gutter (13'2")

After all cables have been run, they should all be checked to make sure that they are not in danger of being cut by any moving parts in the pinspotter, or by a ball hitting them in the ball track area under the lanes. In addition, all the cables should be tied together at the Duo Camera Module and securely tied up out of the way of any balls travelling past on the ball track.

Machine Communications Cable (DXL)

This cable will allow the Duo Camera unit to communicate with advanced Pinsetters such as the AMF 8800Gold, AMF 82-90XL and 90XLi.

These machines allow the Duo to communicate with them at a software level. The Duo determines the score via the Camera and then tells the Pinsetter the score so that it can behave appropriately (Strike Cycle, 7 ±10 pickoff etc.)

The cable designation is as follows:

Pinsetter	Cable Designation
AMF 8800 Gold AMF 82-90XL AMF 90XLi	DXL

AMF 8800 Gold, 82-90XL and 90XLi

Route the SXL cable from the Duo Hardware Module, along the Ball Track, up the kickback, inside the cable channel, to the 8290XL, 8800 Gold or 90XLi chassis at the rear of the Pinspotter. The cable is connected to the CAM/SCORE connector for the 90XLi chassis and the SCORING connector for the 8290XL and 8800 Gold pinspotters. The SXL cable is a serial communications link that transmits data been the Duo Camera Module and the pinspotter.

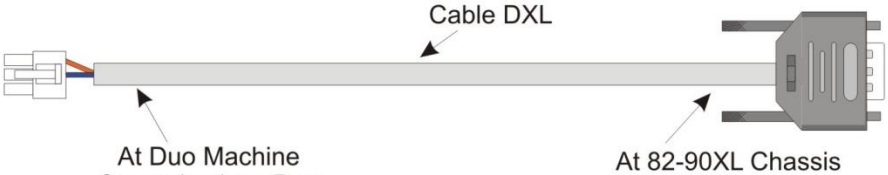
Note: 82-90XL & 8800 Gold DO NOT recognise codes to turn the pinspotter On and Off from the Duo unit. To enable this optional feature, the Lane Control Computers must be connected to the MCU (Managers Control Unit) and software run to enable the MCU commands to be sent from the computer to the pinspotter. For more information on connecting the MCU to the Lane Control Computers, see the **Appendix C: AMF Managers Control Unit Connection** section in this manual.

The 90Xli DOES contain codes to turn the Pinsetters On and Off without the need for an MCU interface.

AMF 8800 Gold & 82-90XL and 90XLi Scoring Connection

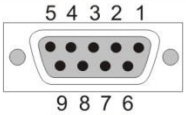
Pin	Function
1	#RX (W/Orange)
2	#TX (Blue)
3	Not Connected
4	RX (Orange)
5	TX (W/Blue)
6	Not Connected

Rear View
Molex Micro-Fit.
6 Pin

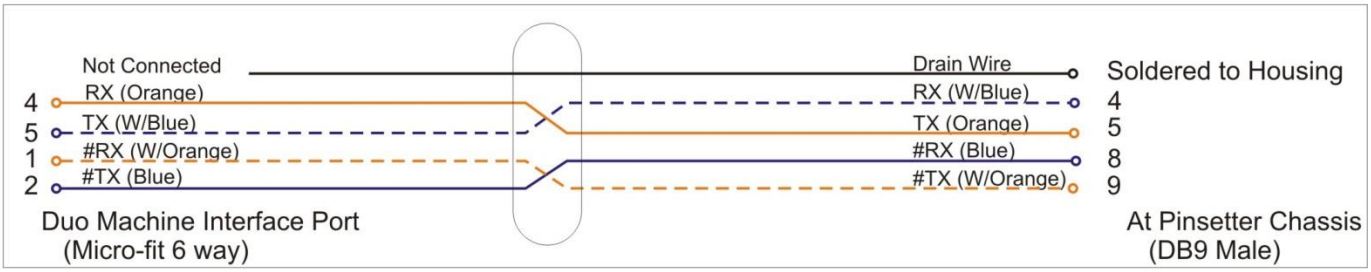


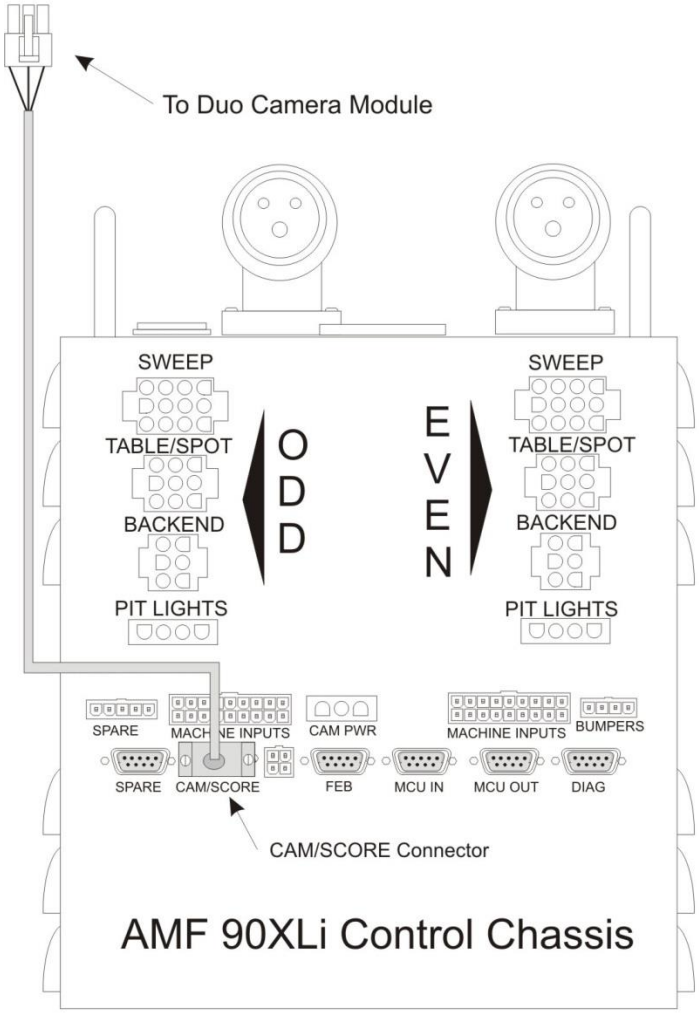
Pin	Function
1	Not Connected
2	Not Connected
3	Not Connected
4	RX (W/Blue)
5	TX (Orange)
6	Not Connected
7	Not Connected
8	#RX (Blue)
9	#TX (W/Orange)

Housing = Drain Wire

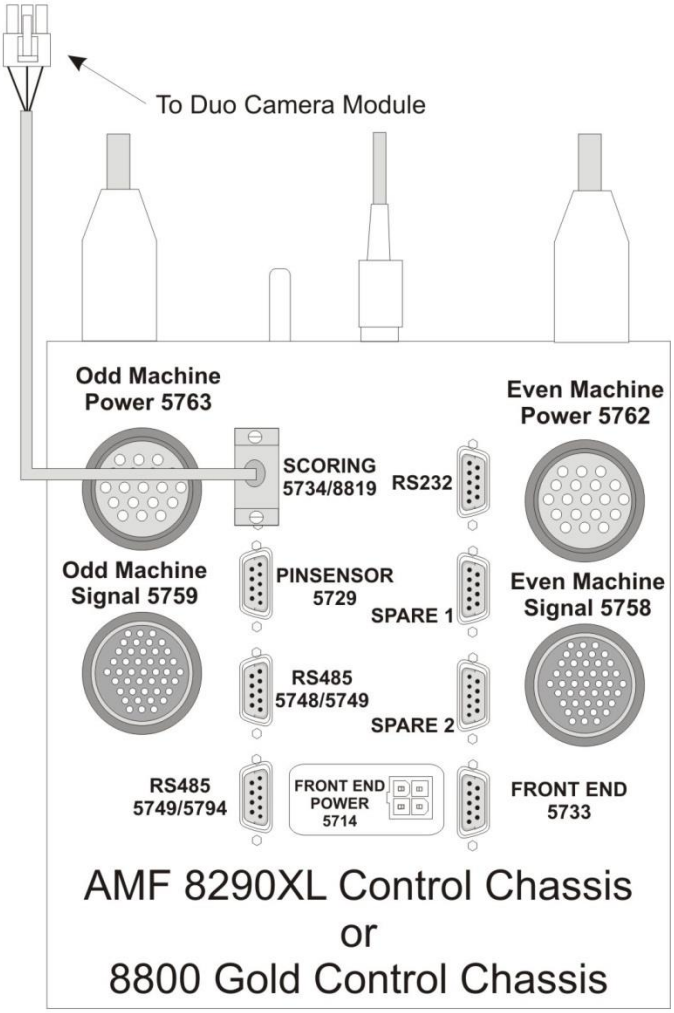


Rear View
DB9 Male
9 Pin





Chassis must be set to accept Pin Data Camera Interface
as **SCORING**
refer Pinspotter and Manager's Control Unit manuals
(Special Functions 14 verses 15)



Chassis must be set to use Pin Data Camera Interface
from the **SCORING** Connector
refer Pinspotter and Manager's Control Unit manuals
(Special Functions 14 verses 15)

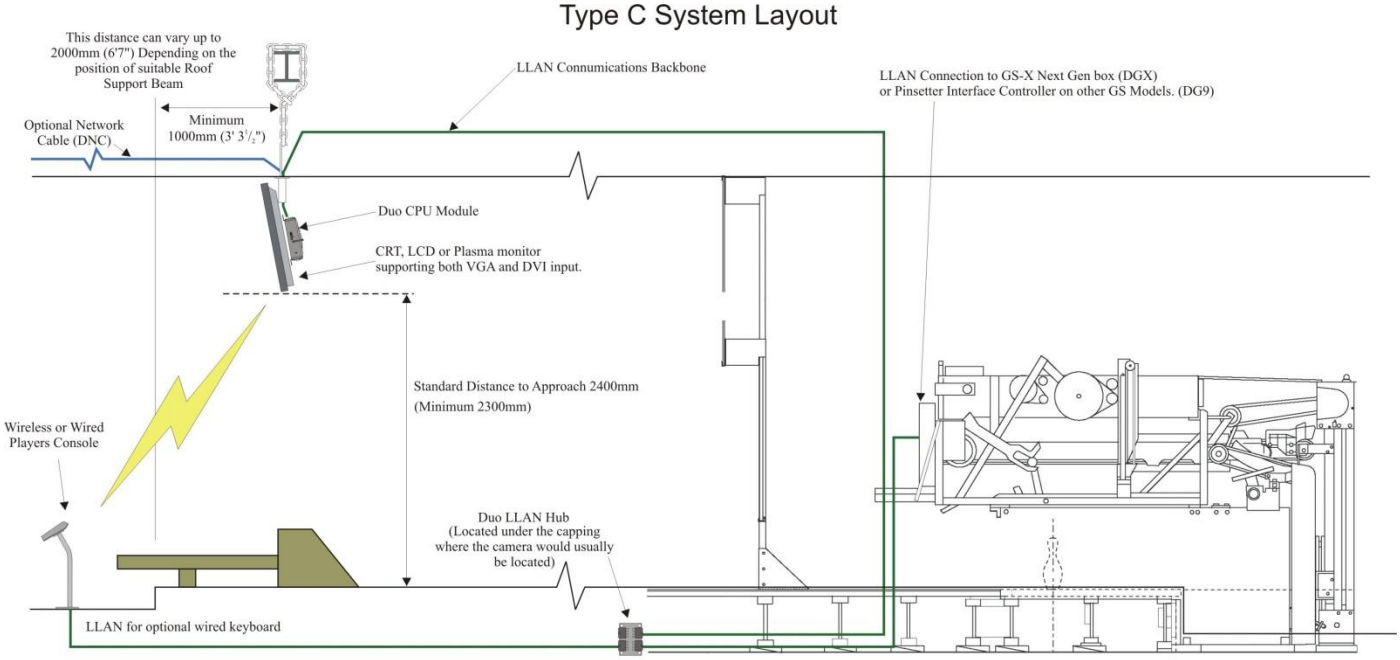
Type C Systems

Type C systems refer to Brunswick GS Series Pinsetters which communicate directly to the Duo CPU module to tell the Duo the score, without the need for a Duo Camera Module at all.

For each pair of lanes in a standard Type C installation there are three communications cables:

1. LLAN — This cable runs from the Duo CPU module to the Duo LLAN Hub. Another LLAN cable is then run from the LLAN Hub to the optional wired connection for the % R Z O H U ¶ V . H \ S D G
2. DNC — This optional cable runs from the Duo CPU module to a network switch in order to gain communications to the Center Command front desk software.
3. DGX or DG9 — This cable runs from the Duo LLAN Hub to the GS control chassis to give and receive commands to both lanes of the pair.

Type C System Layout


This distance can vary up to 2000mm (6'7") Depending on the position of suitable Roof Support Beam
Optional Network Cable (DNC)
Minimum 1000mm (3' 3 1/2")
LLAN Connumications Backbone
LLAN Connection to GS-X Next Gen box (DGX) or Pinsetter Interface Controller on other GS Models. (DG9)
Duo CPU Module
CRT, LCD or Plasma monitor supporting both VGA and DVI input.
Standard Distance to Approach 2400mm (Minimum 2300mm)
Wireless or Wired Players Console
Duo LLAN Hub (Located under the capping where the camera would usually be located)
LLAN for optional wired keyboard

After all cables have been run, they should all be checked to make sure that they are not in danger of being cut by any moving parts in the pinspotter, or by a ball hitting them in the ball track area under the lanes.

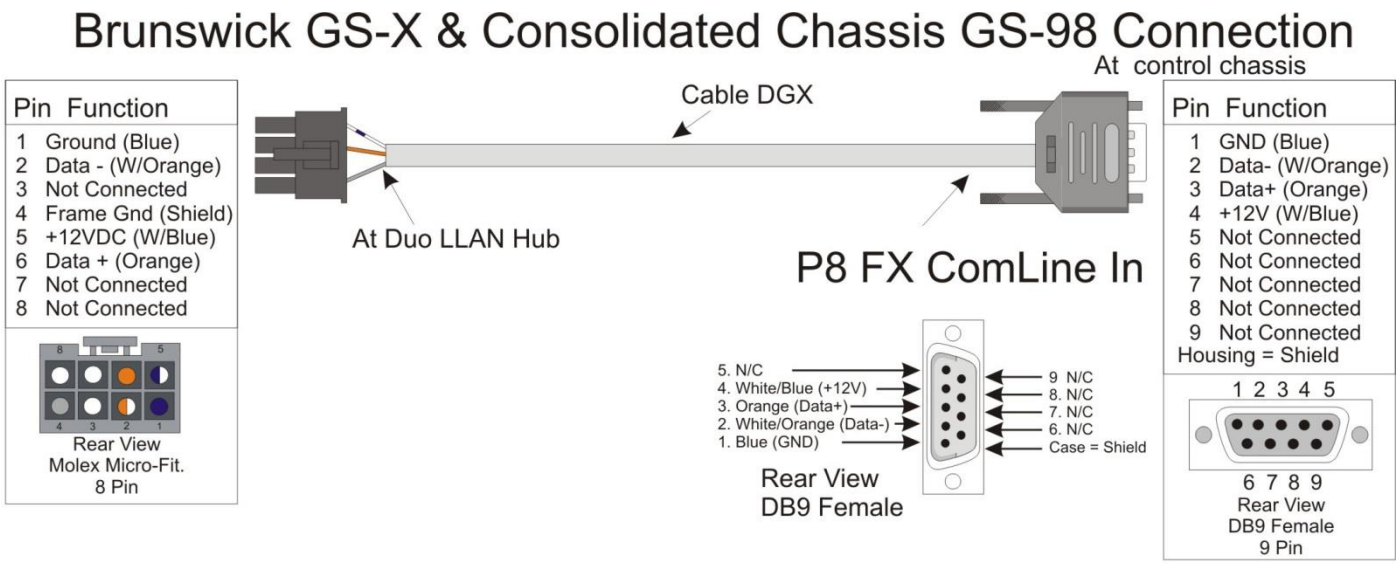
Machine Connection (DGX or DG9)

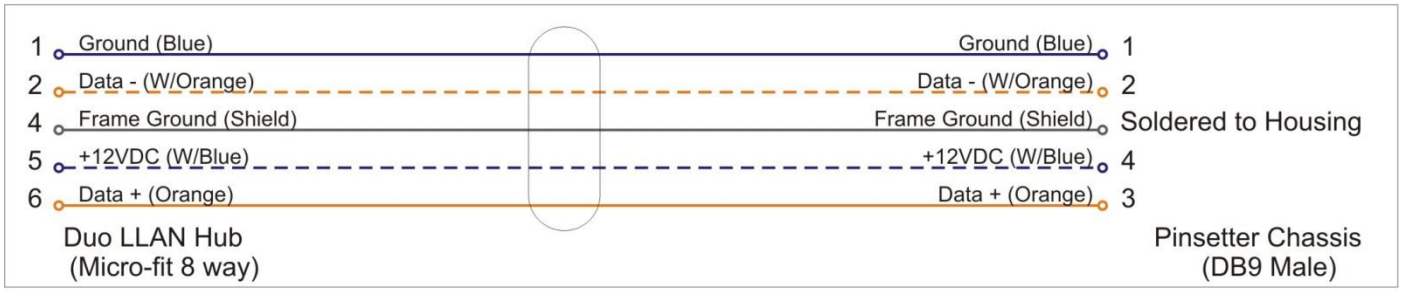
Although the Unified Chassis found on the GS-X and late model GS-98 machines communicate in the same fashion as GS-10, GS-92, GS-96 & early model GS-98 with the Pinsetter Interface Controller, the wiring required is different. This is due to the physical differences found in the electronics.

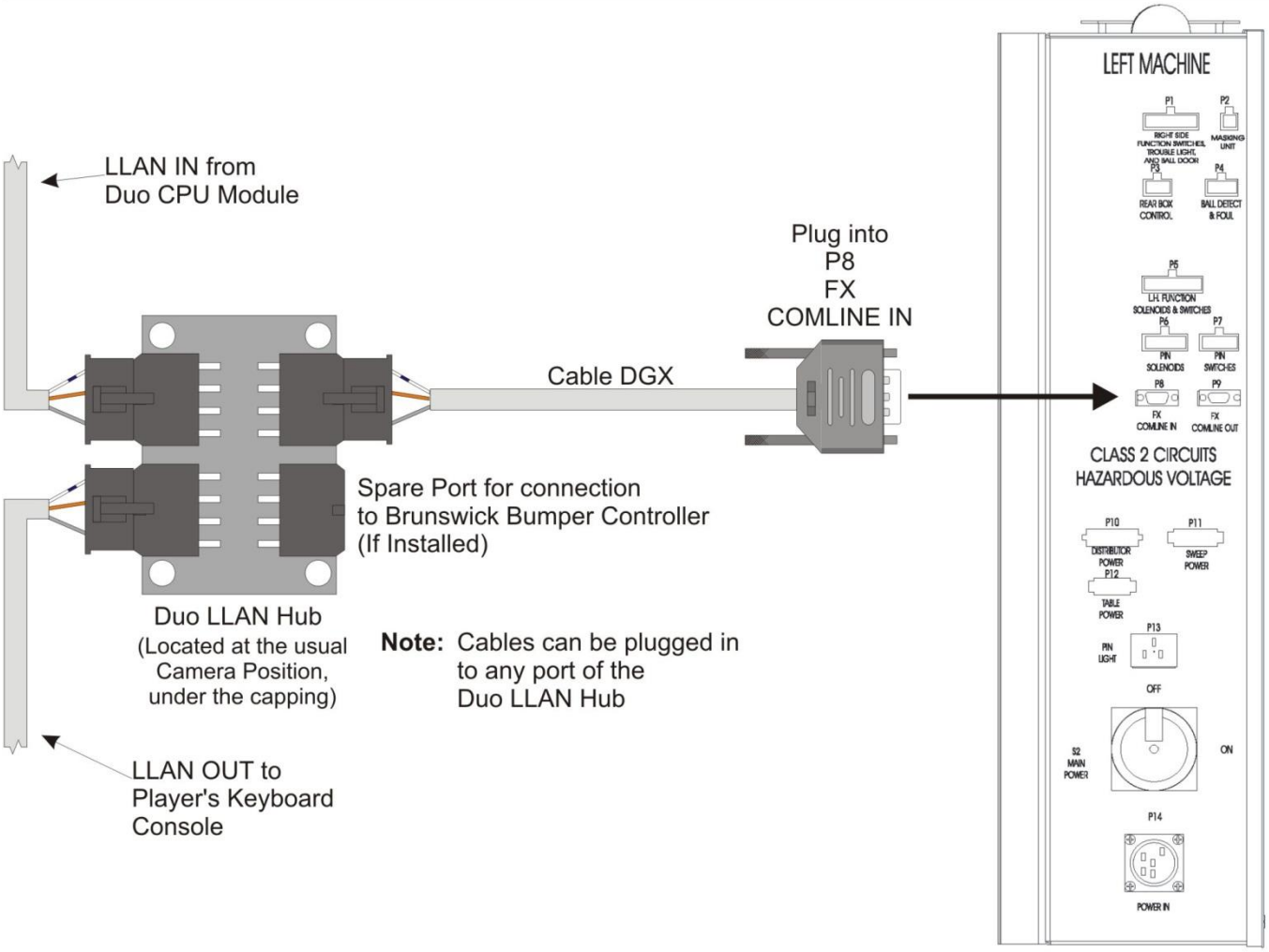
Pinsetter	Cable Designation
Brunswick GS-X Late Model Brunswick GS-98	DGX
Brunswick GS-10 Brunswick GS-92 Brunswick GS-96 Early Model Brunswick GS-98 (All must have Pinsetter Interface Controller fitted).	DG9

Brunswick GS-X (DGX) or Late Model GS-98

Route the DGX cable from the Duo Hub, under the capping, up the kickbacks to the GS-X Next Gen Box or GS-98 Consolidated Box control chassis.

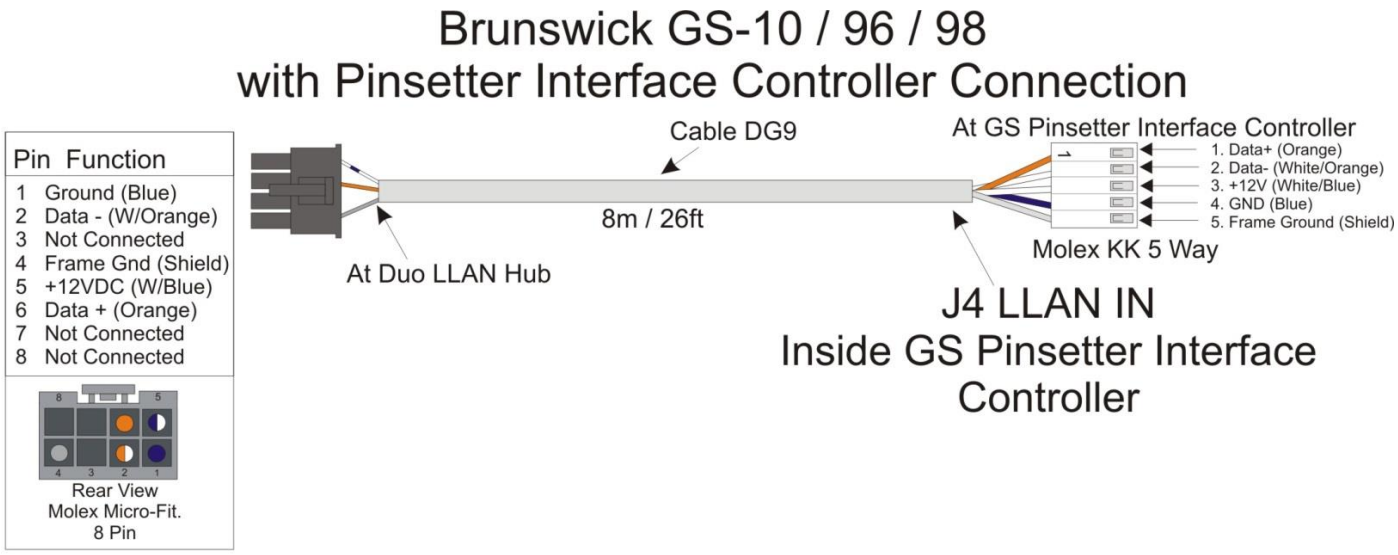


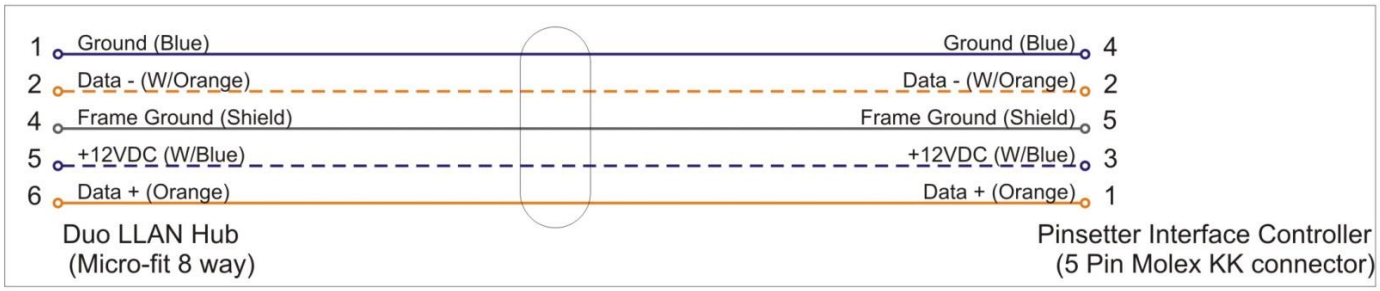

1 Ground (Blue) Ground (Blue) 1
2 Data - (W/Orange) Data - (W/Orange) 2
4 Frame Ground (Shield) Frame Ground (Shield) Soldered to Housing
5 +12VDC (W/Blue) +12VDC (W/Blue) 4
6 Data + (Orange) Data + (Orange) 3
Duo LLAN Hub
(Micro-fit 8 way)
Pinsetter Chassis
(DB9 Male)

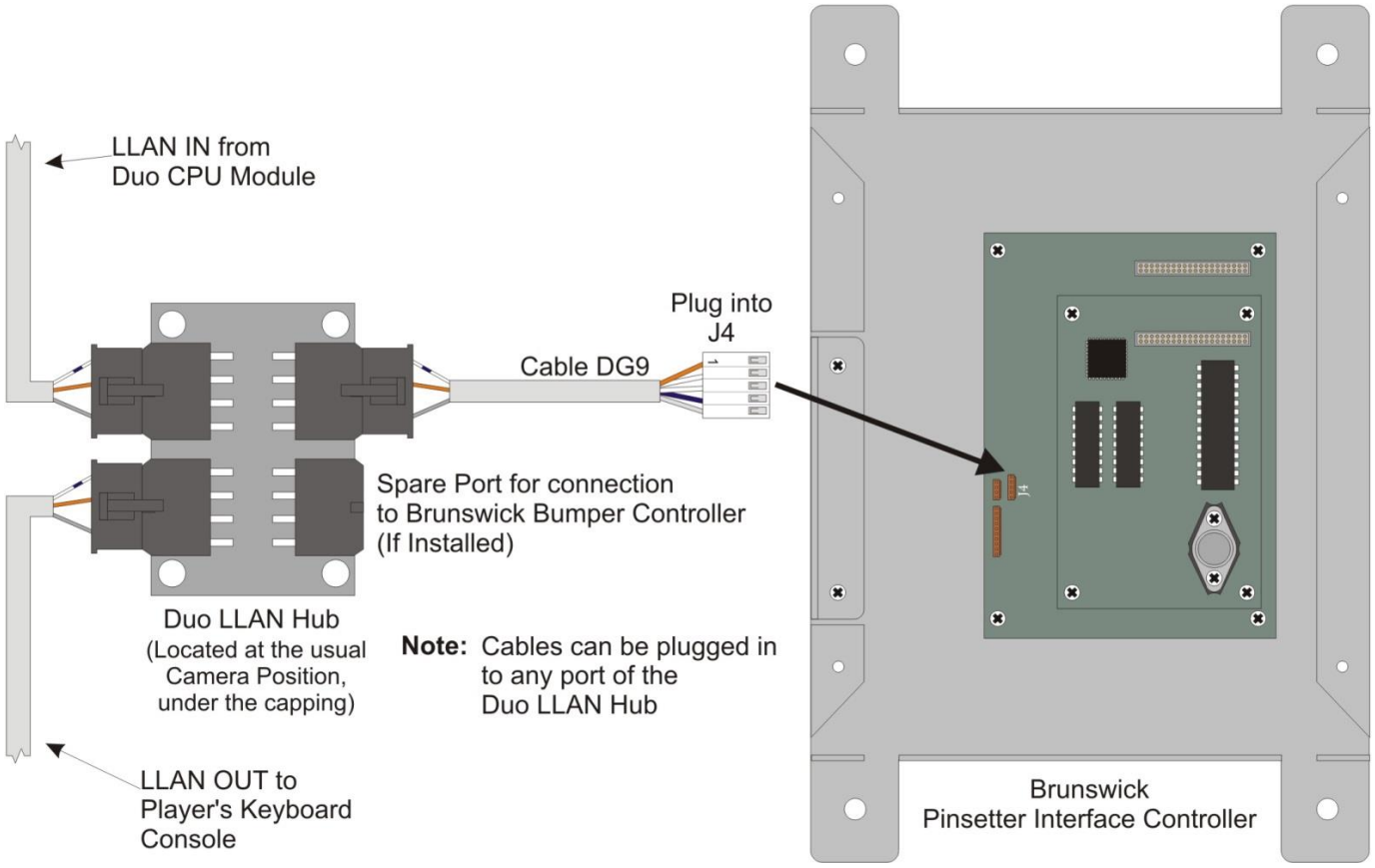


Brunswick GS-10 / 96 / 98 with Pinsetter Interface Controller fitted (DG9).

Route the DG9 cable from the Duo Hub, under the capping, up the kickbacks to the Pinsetter Interface Controller. The plug required is located inside the Pinsetter Interface Controller. Make sure you power off and disconnect BEFORE opening this box. Thread the cable through the existing stain relief clamp before connecting the 5-way connector into the J4 plug.




1 Ground (Blue) Ground (Blue) 4
2 Data - (W/Orange) Data - (W/Orange) 2
4 Frame Ground (Shield) Frame Ground (Shield) 5
5 +12VDC (W/Blue) +12VDC (W/Blue) 3
6 Data + (Orange) Data + (Orange) 1
Duo LLAN Hub
(Micro-fit 8 way)
Pinsetter Interface Controller
(5 Pin Molex KK connector)



&KDSWHU0RXQW WKH %RZOHU¶V .H\SDG FRQVROH

7KH %RZOHU¶V .H\SDG FRQVROH PXVW EH VHFXUHG WR WKH IORRU YH amount of abuse from the public. Even when properly secured, it is necessary to periodically check to make sure that all fittings are still tight. Vandals will exploit any looseness or slack and may result in damage to the pedestal base or the floor itself.

If you are intending to use the optional hard wired cable for communication between the keypad and the Duo &38 0RGXOH WKHQ PDNH VXUH \RX KDYH UXQ WKLV FDEOH IURP WKH 'XR WUDFN SDVW WKH EDOO UHWXUQ WR WKH NH\SDG¶V ORFDWLRQ 7KUHDG the base to the floor. If you are going to use the wireless connection option instead, then there is no need to run the cable and the keypad can be secured at any location.

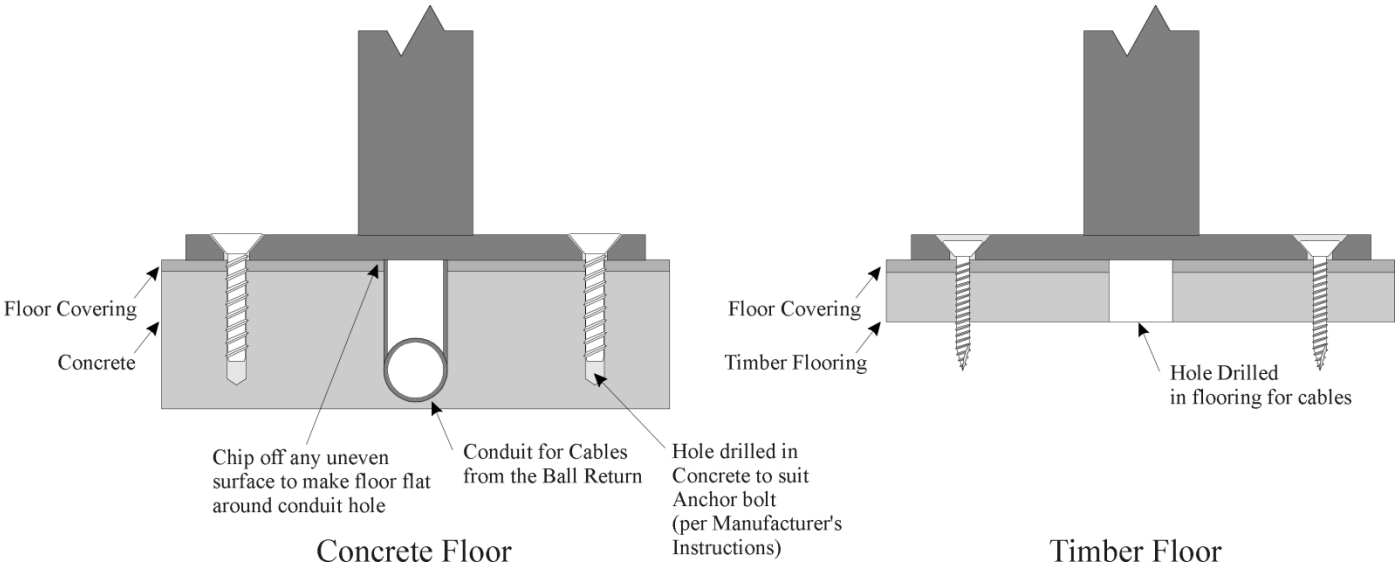
Concrete Floors

For concrete floors, make sure that the floor is level and there is no extra concrete around the conduit. The %RZOHU¶V FRQVROH VKRXOG EH DEOH WR VLW IODW RQ WKH IORRU ZLWKI

Drill the correct size hole in the concrete and use a concrete anchor bolt, or Tiger Bolt, to secure the console to the floor.

Timber Floors

For timber floors use a hex drive self- GULOOLQJ VFUHZ WR VHFXUH WKH %RZOHU¶V &R use fresh holes to ensure that the screws bite into the timber flooring well.


Floor Covering
Concrete
Chip off any uneven surface to make floor flat around conduit hole
Conduit for Cables from the Ball Return
Hole drilled in Concrete to suit Anchor bolt (per Manufacturer's Instructions)
Concrete Floor
Floor Covering
Timber Flooring
Hole Drilled in flooring for cables
Timber Floor

Warning: *Eye Protection, Ear Protection and a Dust Mask must be worn.*

Note: *Take care to ensure the SKC cable is not pinched or damaged when securing the keypad console.*

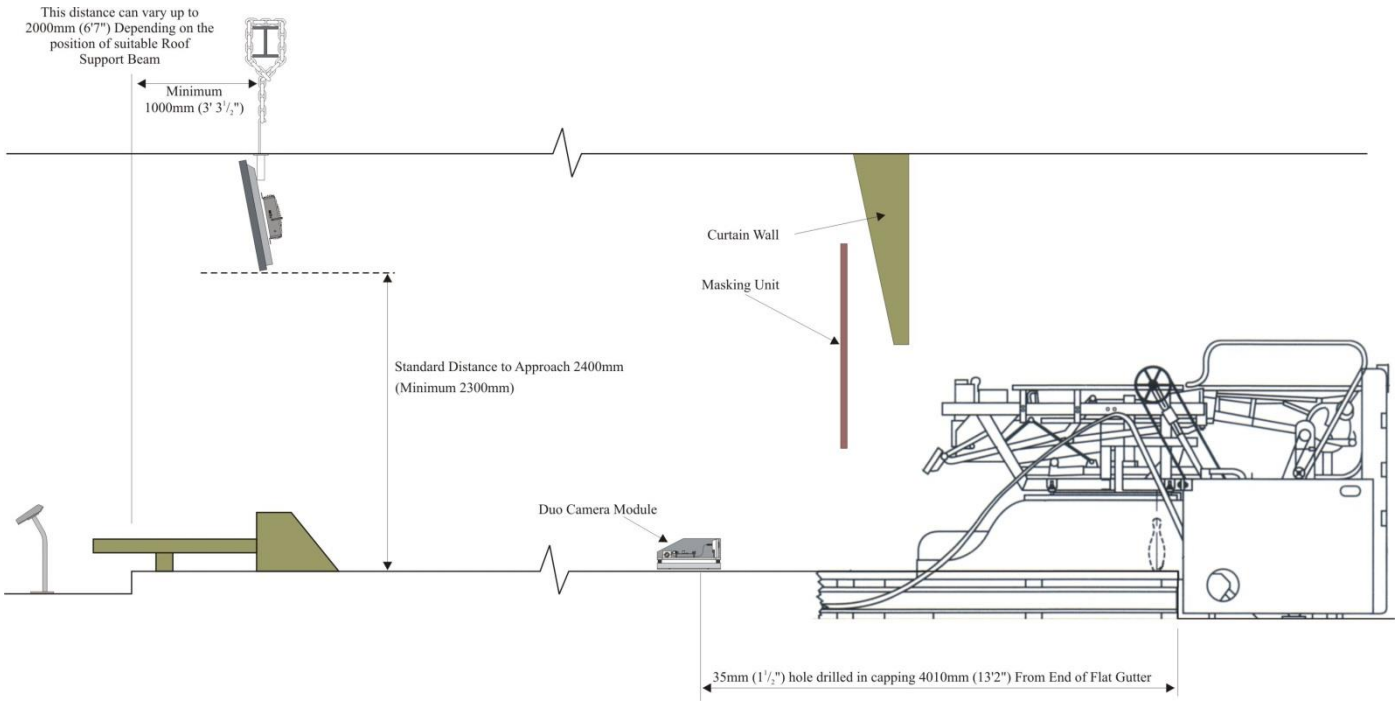
&KDSWHU 6HFXUH WKH FDSSLQJ

Perform this step ONLY if you use Type A or B connections to your Pinsetters. Skip this step if you use a Type C connection (Brunswick GS series)

In order for the Duo system to consistently take accurate scores, the Camera Module MUST be securely attached to the lanes with no movement. For installation simplicity, the Duo Camera Module is designed to be screwed directly to the capping. Therefore, a section of the capping itself (Not the entire capping) must also be securely fastened to the sub timbers to avoid mis-scoring due to movement of the capping and Camera unit. You do not need to secure the capping along the entire lane, only a short length that will hold the Duo Unit.

Capping has, in the past, been made from three different materials: Timber, Metal and Plastic. All these types must be securely fastened.

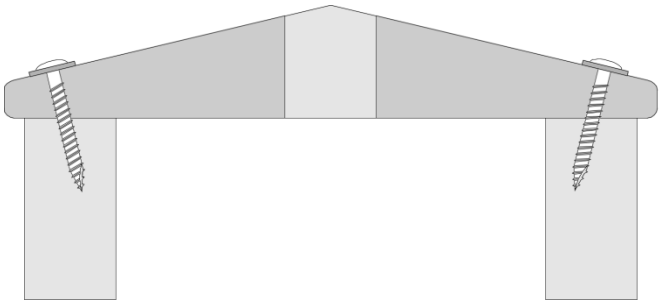
,Q DOO FDVHV WKHUH PXVW EH D FDEOH DFFHVV KROH LQ WKH FDSSL

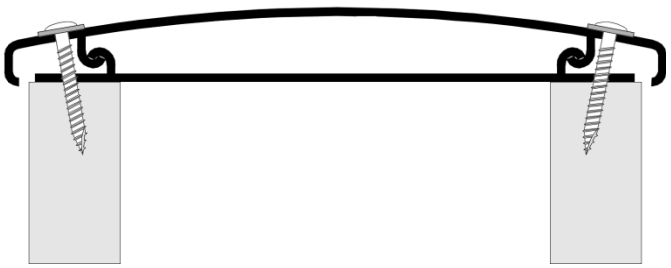

This distance can vary up to 2000mm (6'7") Depending on the position of suitable Roof Support Beam
Minimum 1000mm (3' 3½")
Curtain Wall
Masking Unit
Standard Distance to Approach 2400mm (Minimum 2300mm)
Duo Camera Module
35mm (1½") hole drilled in capping 4010mm (13'2") From End of Flat Gutter

Wooden and Plastic Capping

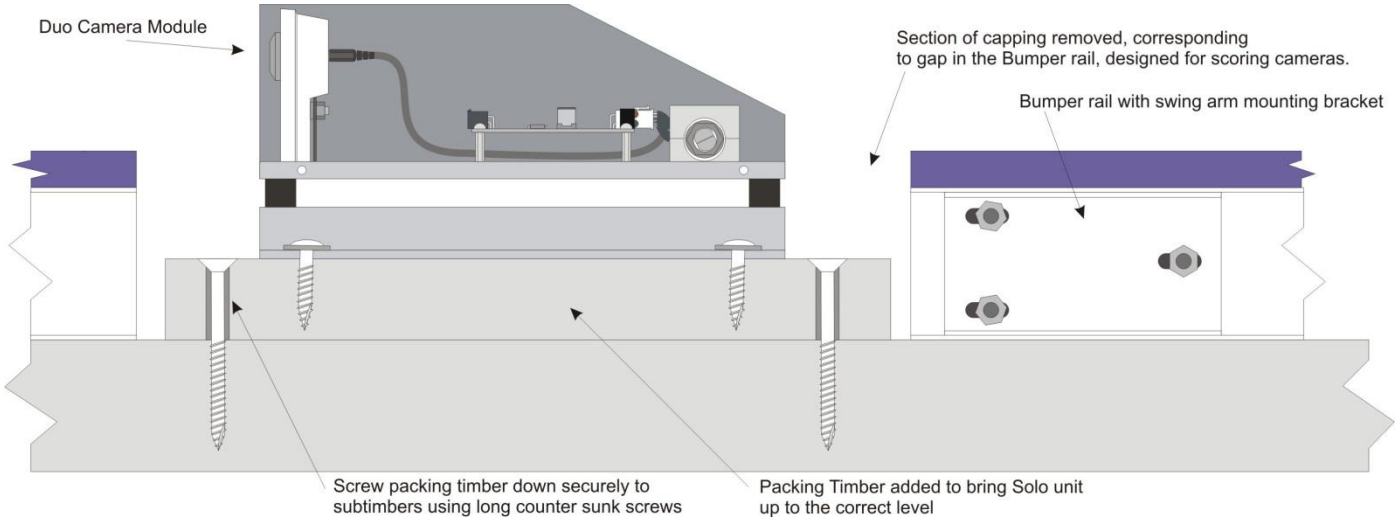
The procedure for all Wooden and Plastic Capping is the same.

1. Drill a hole in the center of the ca S S L Q J R I P P G L D P H W H U $ S S U R [ò ´ P H D V P P ¶ ´ I U R P W K H H G J H R I W K H 7 D L O S O D Q N
2. Pull all the cables previously run in Chapter 2 through the hole.
3. Screw the capping securely to the sub timbers.





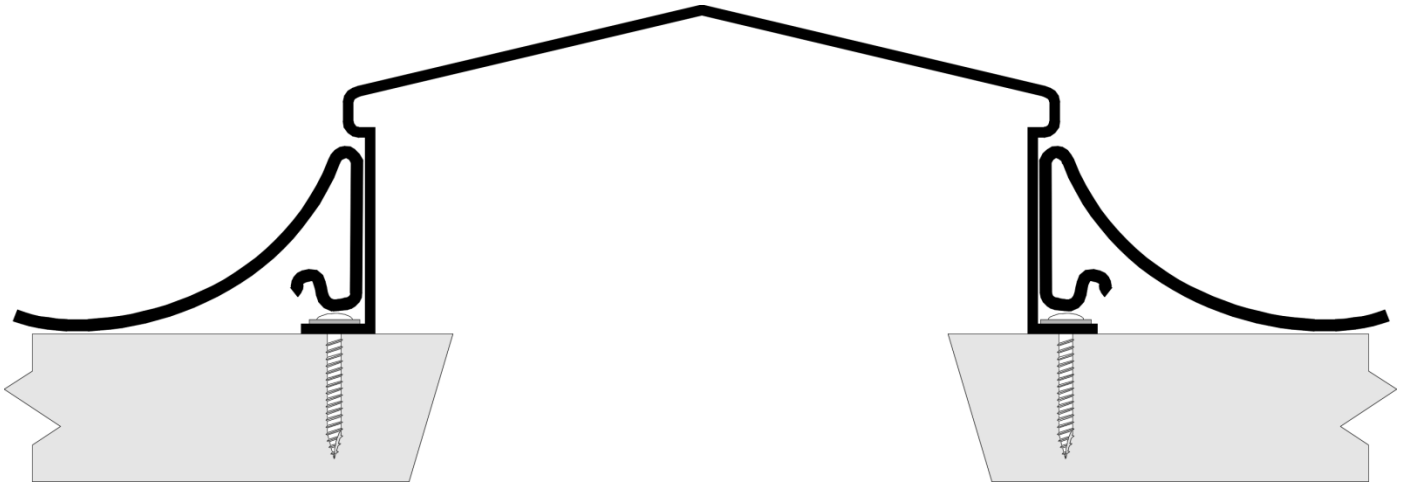
Note: Horizontal Bumpers. The only exception to the above steps is in the situation where swing out type bumpers has been previously installed. In this case, there is usually a gap between the existing bumper rails, at the position of the camera. A section of capping must be removed and packing timber must be secured to the sub timbers to allow the Duo Camera unit to be mounted at the correct height. See **Chapter 5: Accounting for Bumper Rails** below for more information on mounting to Duo Camera unit to account for bumpers.


Duo Camera Module
Section of capping removed, corresponding to gap in the Bumper rail, designed for scoring cameras.
Bumper rail with swing arm mounting bracket
Screw packing timber down securely to subtimbers using long counter sunk screws
Packing Timber added to bring Solo unit up to the correct level

Metal Capping

Metal capping is most often used in Brunswick centers. This method does not use any sub timbers and the capping is screwed directly to the trusses underneath the lane. In this case:

1. Drill a pilot hole in the center of the capping and then use a metal saw of 35mm diameter $SSUR[ò´ PHDVXUHG PP ¶´ IURP WKH HGJH RI WKH 7D use a hole saw designed for cutting through steel.
2. Remove any sharp edges from the hole with a half round steel file. If you wish, you could use a rubber grommet to cover the edge for safety reasons.
3. Pull all the cables previously run in Chapter 2 through the hole.
4. Make sure that all screws that secure the capping to the trusses are tight and there is no movement in the capping.



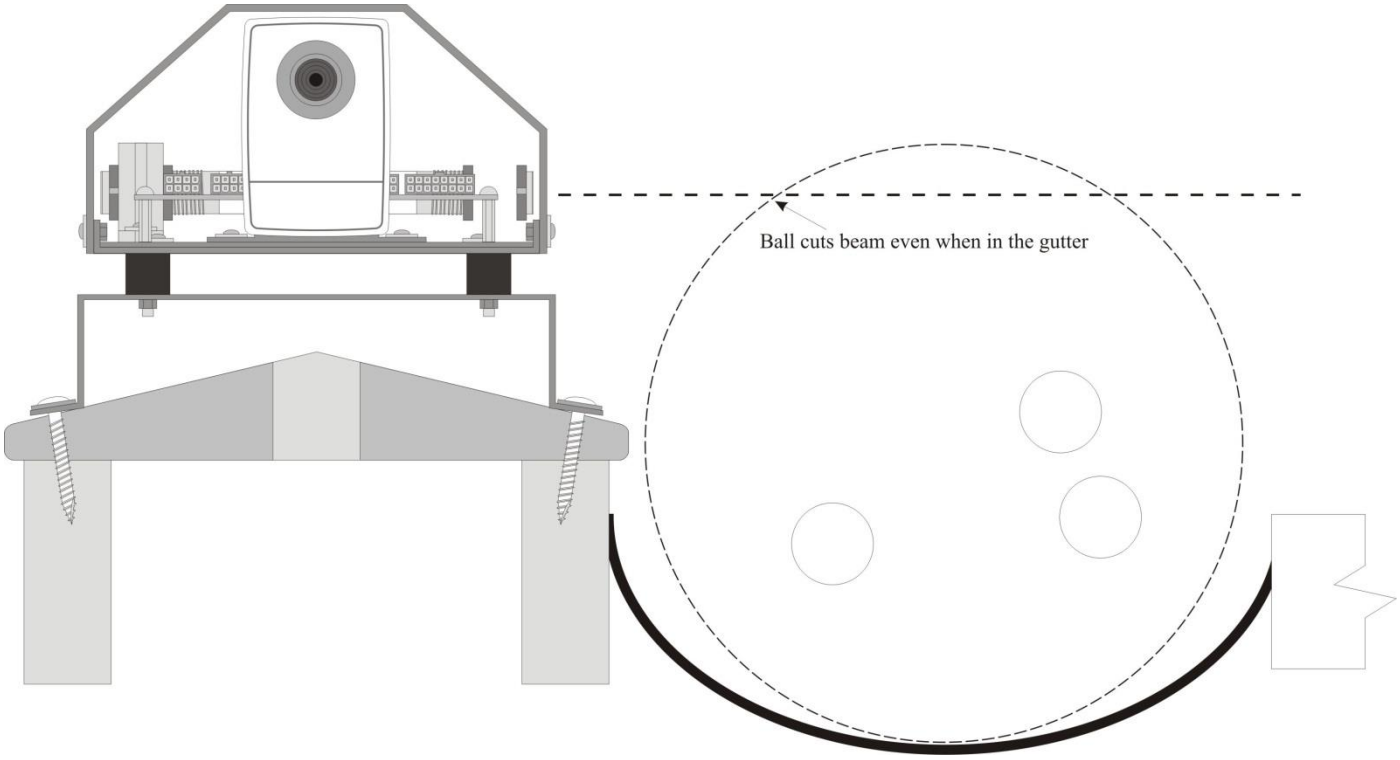
&KDSWHU $FFRXQWLQJ IRU %XPSHU 5DLOV

Perform this step ONLY if you use Type A or B connections to your Pinsetters and you have bumper rails fitted. Skip this step if you use a Type C connection (Brunswick GS series)

The Duo system relies on the ability to detect that a ball has gone past in order to start the scoring software routine. However, bumper rails can interfere with this because, if the Duo Camera unit is positioned incorrectly, the rail can cut the beam when it is raised or extended. No matter how the Duo Camera unit is mounted, the Ball Detector must be below the top of the ball when it is in the gutter. Otherwise a gutter ball will not result in a miss score.

No Bumpers

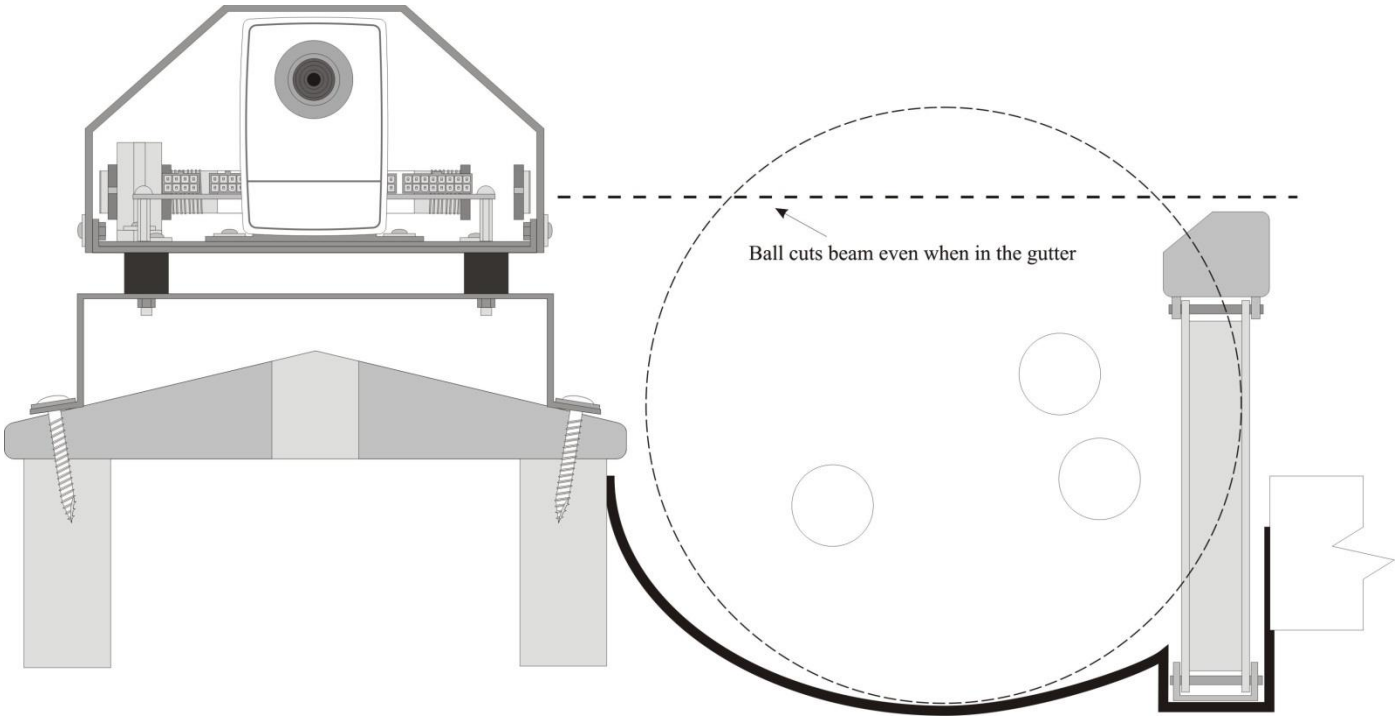
Where no bumpers have been installed on the lanes, securely attach the Duo Camera Module directly to the capping, which has been secured in Chapter 4 above. Make sure that a ball will cut the ball detector beam when it is in the gutter.



Vertical Bumpers and Ball Wall

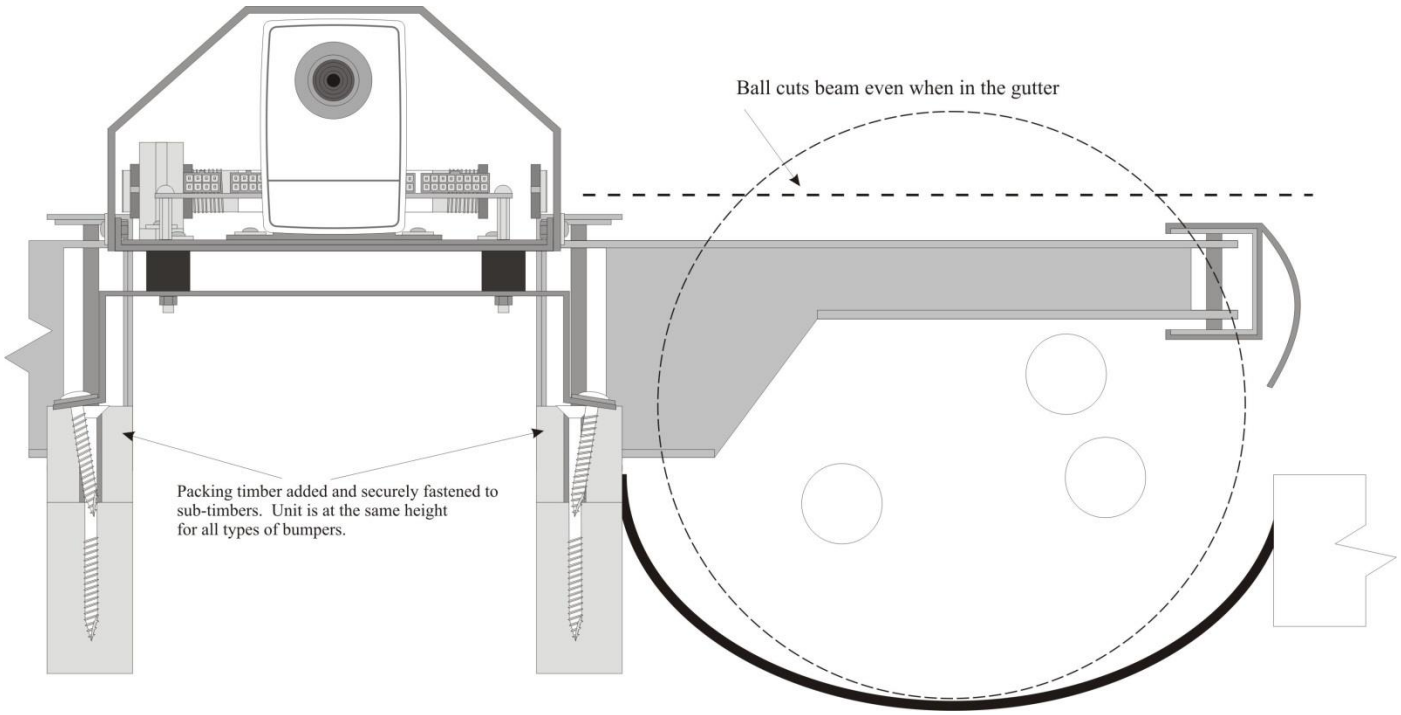
%XPSHU V\VWHPV VXFK DV %UXQVZLFN¶V %DOO :DOO 3LQEDOO :L]DU
from the gutter (or tilt the whole gutter in the case of Ball Wall). Therefore it is important that the Duo Camera Module be high enough so that the raised bumper rail does not cut the beam from the Ball Detector.

Where Vertical bumpers have been installed on the lanes, securely attach the Duo Camera Module directly to the capping, which has been secured in Chapter 4 above. Make sure that a ball will cut the ball detector beam when it is in the gutter.



AMF Horizontal swing out type

Horizontal Bumpers. The only exception to the above steps is in the situation where swing out type bumpers in installed. In this case, there is usually a gap between the existing bumper rails, which are used as an area for older scoring scanners. A section of capping must be removed and packing timber must be secured to the sub timbers in order for the Duo unit to be mounted at the correct height. Make sure that a ball will cut the ball detector beam when it is in the gutter. See Chapter 4 for more information on the packing timber needed and removing a section of capping.


Ball cuts beam even when in the gutter
Packing timber added and securely fastened to sub-timbers. Unit is at the same height for all types of bumpers.

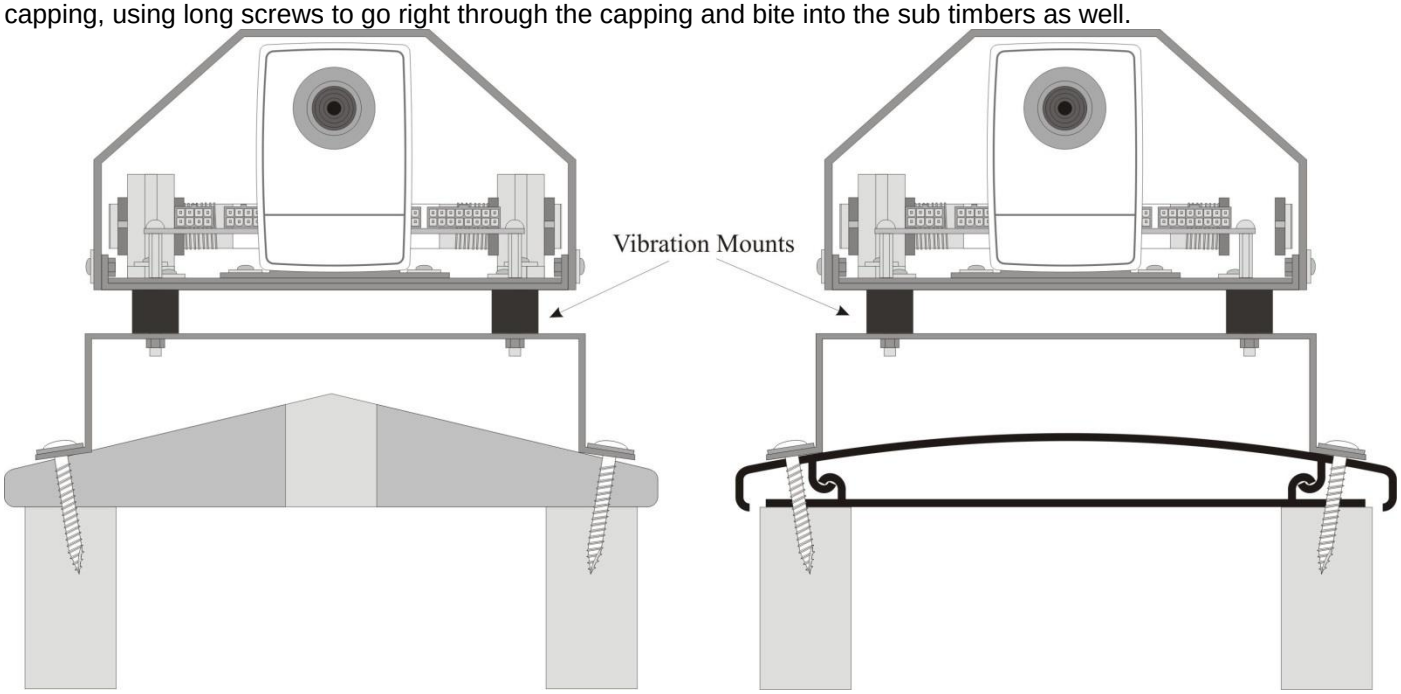
&KDSWHU ,QVWDOO WKH ’XR &DPHUD 0RGXO

Perform this step ONLY if you use Type A or B connections to your Pinsetters. Skip this step if you use a Type C connection (Brunswick GS series)

Secure to the Capping

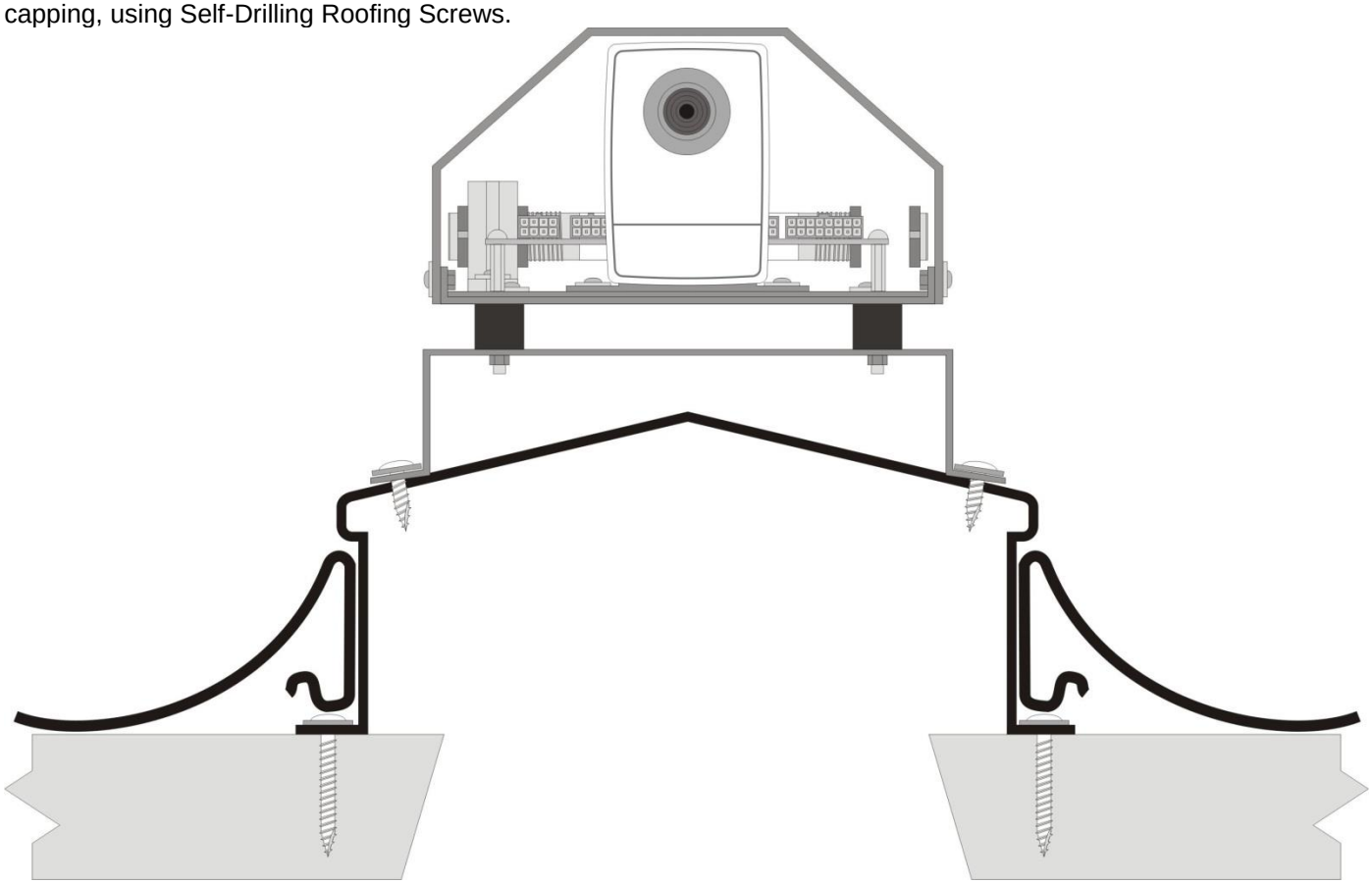
AMF and Brunswick Wooden and Plastic Capping

Make sure that the Duo Unit is straight on the capping and in the middle. Then mount the Duo Units directly to the capping, using long screws to go right through the capping and bite into the sub timbers as well.



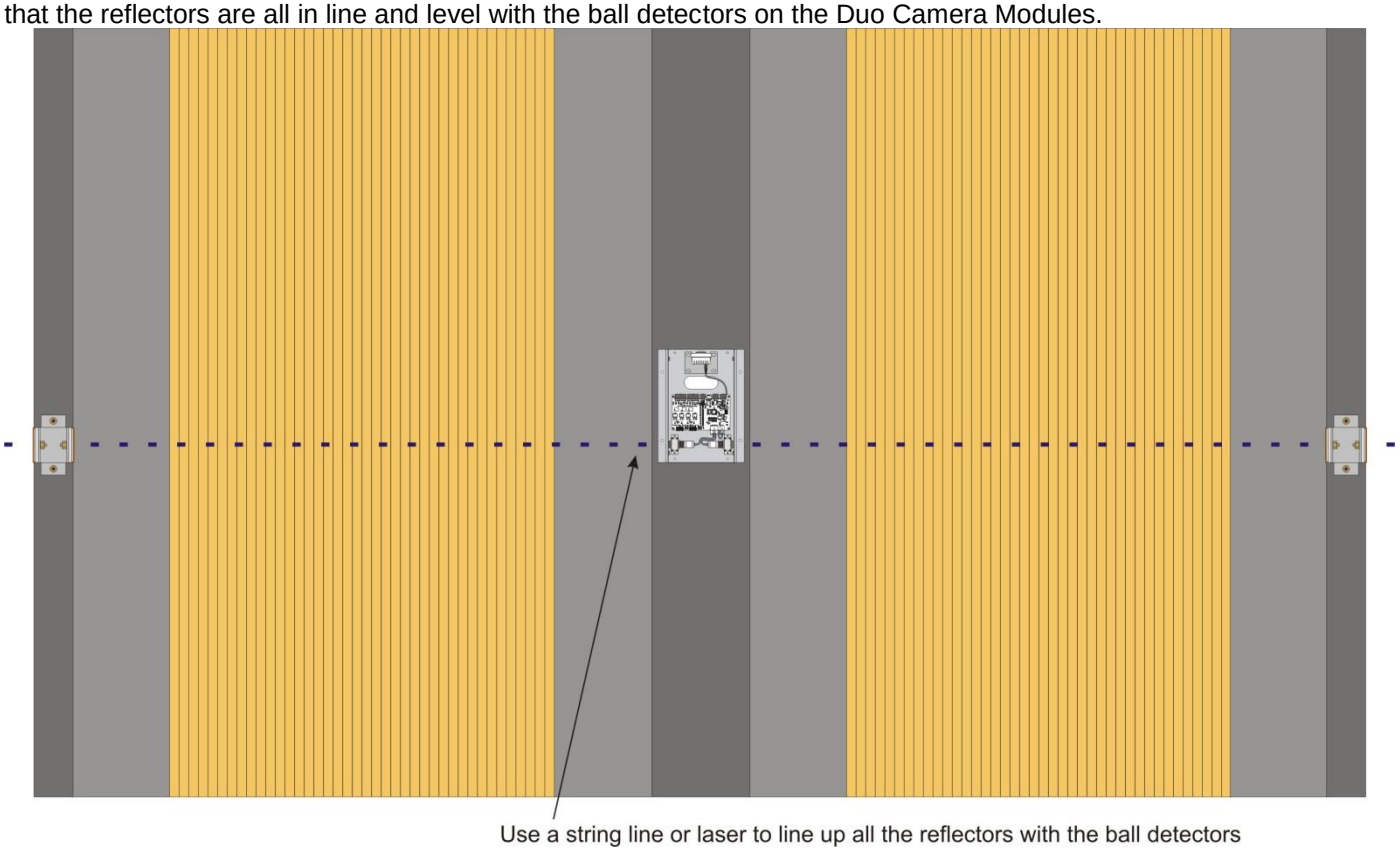
Brunswick Metal Capping

Make sure that the Duo Unit is straight on the capping and in the middle. Then mount the Duo Units directly to the capping, using Self-Drilling Roofing Screws.



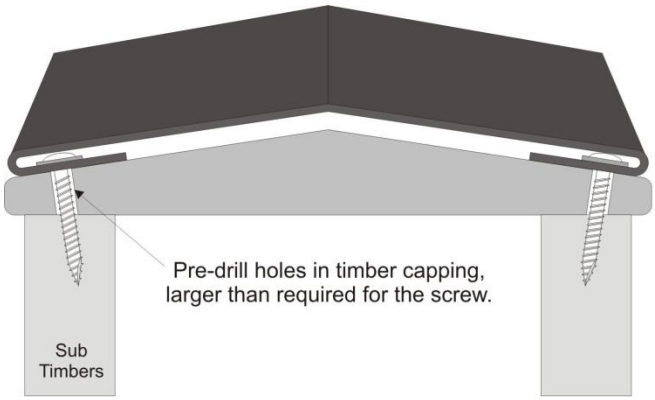
Mount the Reflectors

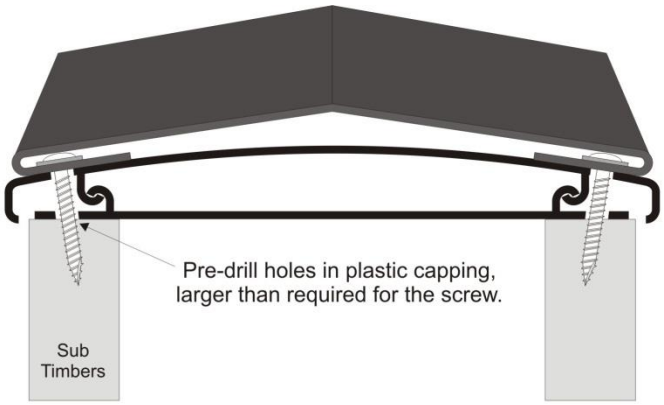
Screw down the reflectors of the ball detectors on the intermediate (Thin) capping. Make sure that the reflectors are all in line and level with the ball detectors on the Duo Camera Modules.

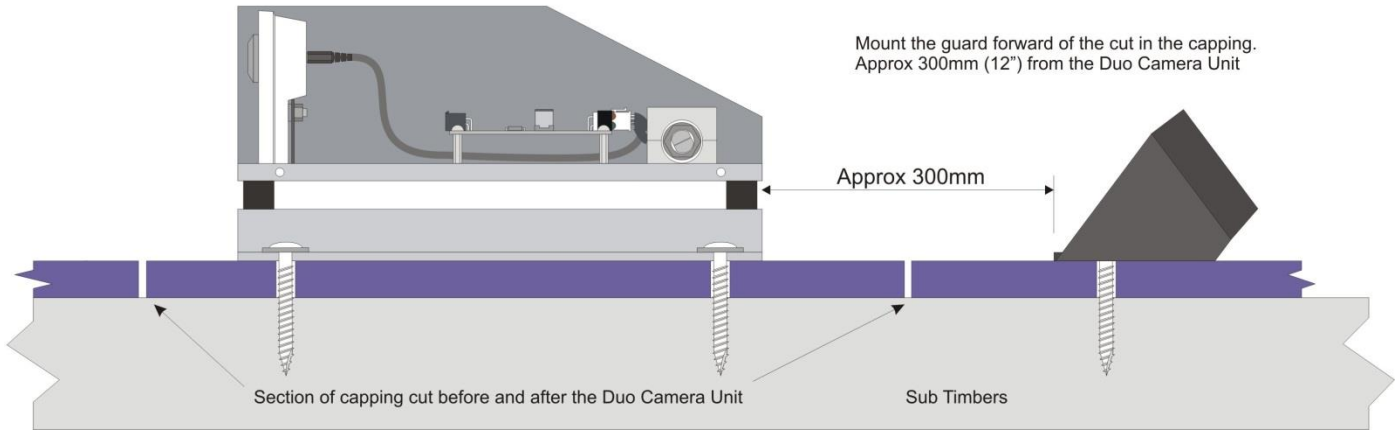


Mount Optional Camera Protector

Incorrectly bowled balls, delivered by deliberately bowling down the capping between raised bumpers, can impact the Duo Camera unit and result in damage. Secure the Option Camera Protection Steelwork to the sub timbers, in front of the nearest join in the capping.





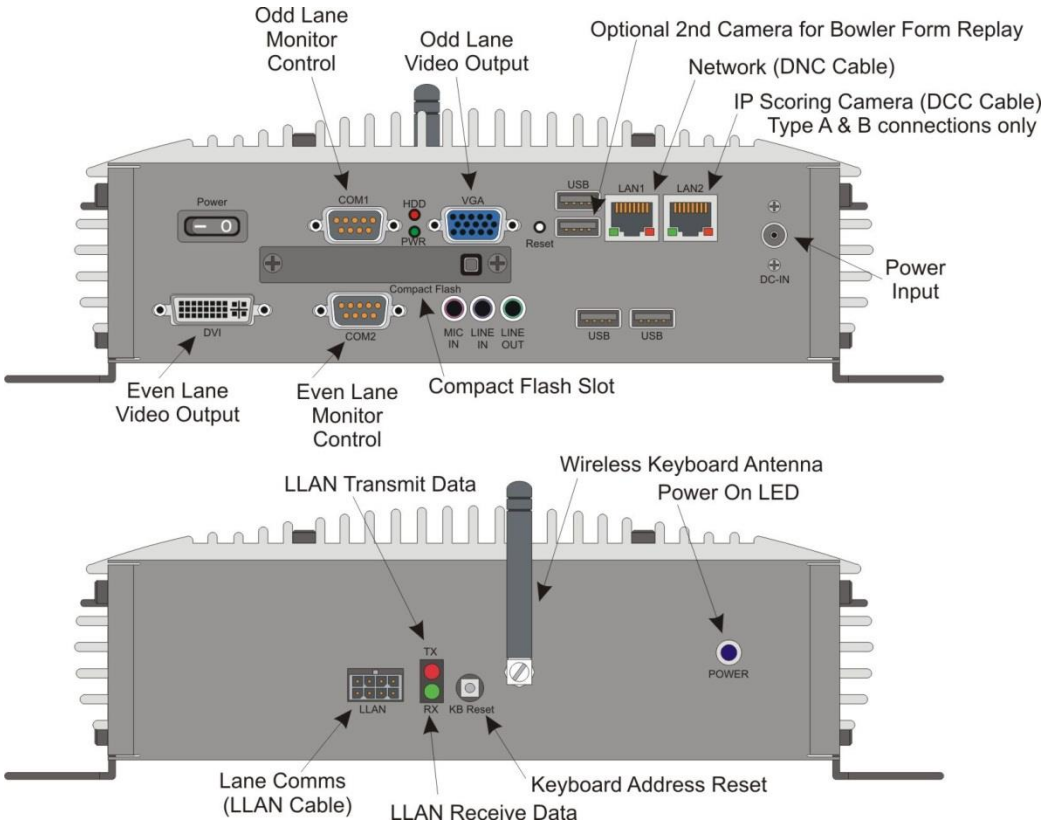

Mount the guard forward of the cut in the capping.
Approx 300mm (12") from the Duo Camera Unit
Approx 300mm
Section of capping cut before and after the Duo Camera Unit
Sub Timbers

&KDSWHU 3OXJ,QZHU 2Q

The final step in installing the lane hardware is to plug in all the cables, power on the system and align the ball detectors.

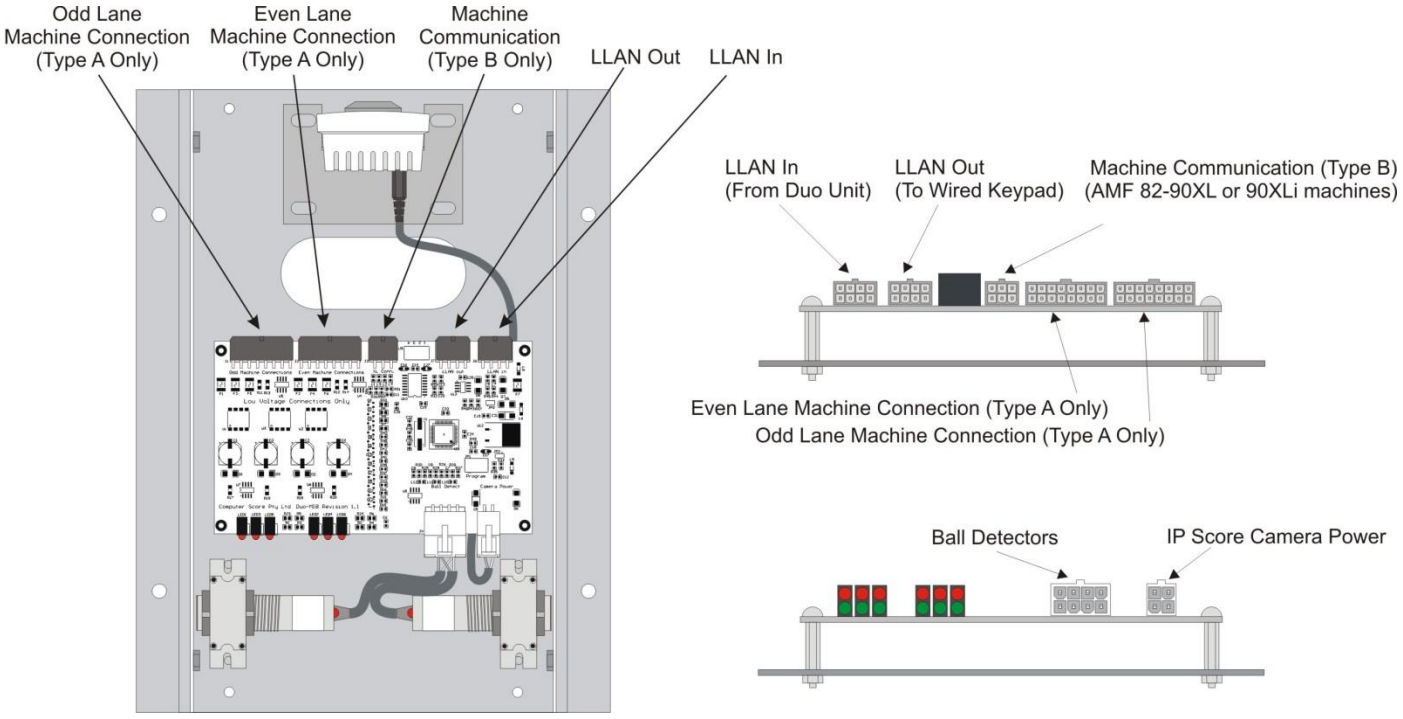
At the Duo CPU Module

Plug in all your cables into their corresponding connectors on the Duo CPU Module as shown below:



At the Duo Camera Module

For Type A and Type B systems, install the various cables at both ends of the line as shown below. Type C systems do not require this step, as the Duo Camera Module is not present.


Odd Lane Machine Connection (Type A Only)
Even Lane Machine Connection (Type A Only)
Machine Communication (Type B Only)
LLAN Out
LLAN In
LLAN In (From Duo Unit)
LLAN Out (To Wired Keypad)
Machine Communication (Type B) (AMF 82-90XL or 90XLi machines)
Even Lane Machine Connection (Type A Only)
Odd Lane Machine Connection (Type A Only)
Ball Detectors
IP Score Camera Power

At the Bowler's Keypad

7KH 'XR V\VWHP KDV WKH RSWLRQ WR FRPPXQLFDWH ZLWK WKH ERZOH alternatively via an extension of the LLAN wired communications cable. Also, you have the option of either one or two keypads per lane pair.

Depending on whether these options, you must set the following settings on the PC Board inside the keypad. This will tell the Keypad PCB Board how to behave when a key is pressed.

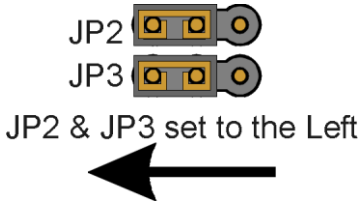
		JP2	JP3	¶ V	¶ V
Wired	Single Keypad	Left	Left	0 (Zero)	0 (Zero)
	Dual Keypads - Odd Lane	Left	Left	0 (Zero)	1 (One)
	Dual Keypads - Even Lane	Left	Left	0 (Zero)	2 (Two)
Wireless	Single Keypad	Right	Right	0 (Zero)	4 (Four)
	Dual Keypads - Odd Lane	Right	Right	1 (One)	0 (Zero)
	Dual Keypads - Even Lane	Right	Right	2 (Two)	0 (Zero)

Please note: No other combination of channels is valid.

Wired Keypads

The advantage of wired keypads is they afford greater reliability, however there is more work to do (and therefore expense) at the time of installation.

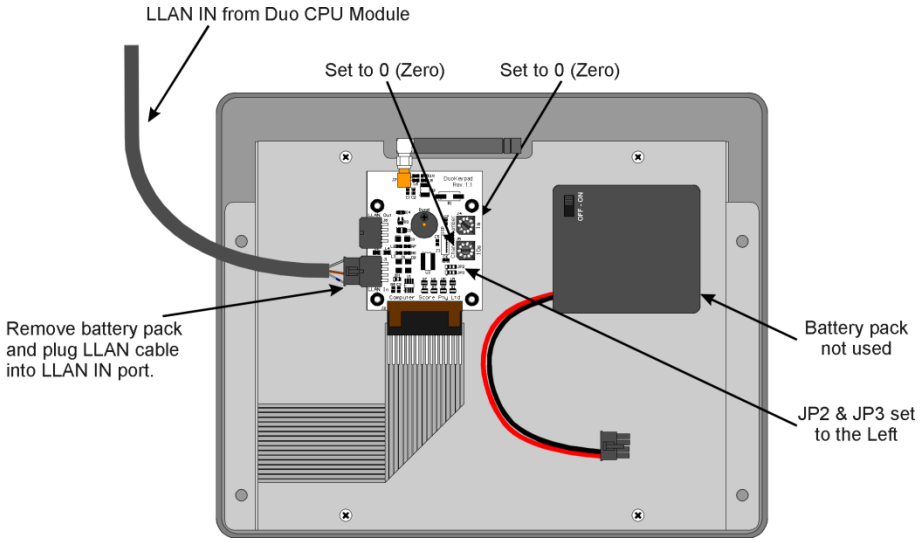
For all wired keypads, either single or dual, you must first verify that the jumper for JP2 and JP3 are set to the **Left**. This will activate the communications drivers on the PC Board to send the signal via the LLAN cable.



Single Wired Keypads

Remove the battery pack connector and plug in the LLAN cable from the Duo CPU Module into the LLAN IN connector on the Keyboard PCB (Printed Circuit Board).

7KHQ VHW WKH &KDQQHO 1XPEHU RQ ERWK WKH 5RWDU\ ',3 VZLWFKH WKH ¶V V Zero. When this is done, the keypad will send out a signal to the Duo CPU module whenever a key is pressed, without specifying Odd or Even Lane.


LLAN IN from Duo CPU Module
Set to 0 (Zero)
Set to 0 (Zero)
Remove battery pack and plug LLAN cable into LLAN IN port.
Battery pack not used
JP2 & JP3 set to the Left

Dual Wired Keypads

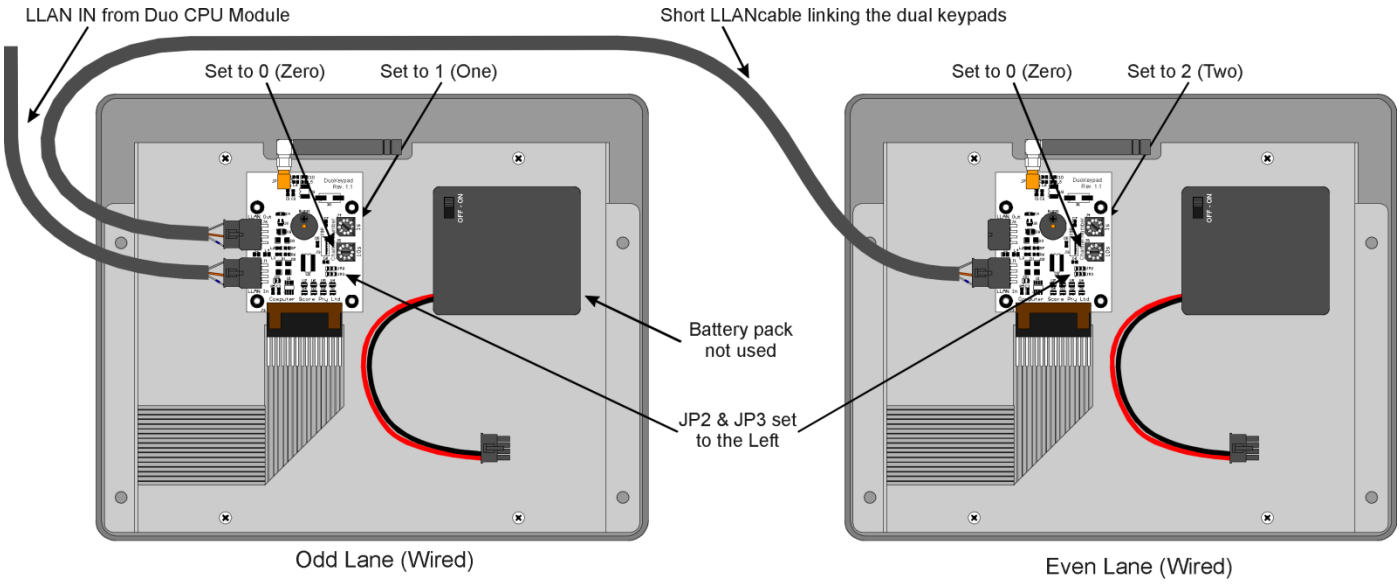
Remove the battery pack connector and plug in the LLAN cable from the Duo CPU Module into the LLAN IN connector on the Keyboard PCB (Printed Circuit Board) of the Odd Lane.

Then, run a short LLAN cable from the LLAN OUT of the Odd Lane, through the steel keypad stand to the / / $ 1 , 1 R I W K H (Y H Q / D Q H ¶ V N H \ S D G

Then you must set the Channel Number on the Rotary DIP Switches to:

- I R U W K H 2 G G / D Q H = H U R R Q W K H ¶ V V Z L W F K D Q G 2 Q H R Q
  and
- I R U W K H (Y H Q / D Q H = H U R R Q W K H ¶ V V Z L W F K D Q G 7 Z R R

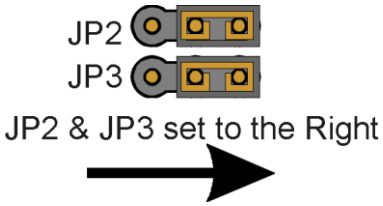
This is so the keypad can send a signal for left or right lane via the LLAN plug, every time a key is pressed.


LLAN IN from Duo CPU Module
Short LLANcable linking the dual keypads
Set to 0 (Zero)
Set to 1 (One)
Set to 0 (Zero)
Set to 2 (Two)
Battery pack not used
JP2 & JP3 set to the Left
Odd Lane (Wired)
Even Lane (Wired)

Wireless Keypads

The advantage of wireless keypads is they allow you to have greater flexibility as to where they are located, they are also advantageous in situations where there is no cable conduit to the E R Z O H U ¶ V V F R U H W D E O H + will occasionally need to change the batteries in order for them to continue to operate.

For all wireless keypads, either single or dual, you must first verify that the jumper for JP2 and JP3 are set to the **RIGHT**. This will <u>disconnect</u> the LLAN communications drivers on the PC Board and hence improve battery life.



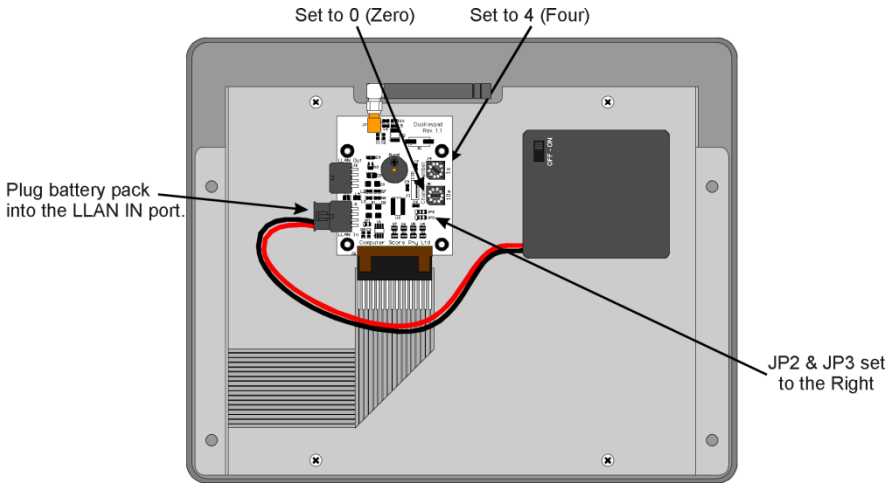
When the power is first supplied to the keypad PC Board, the keypad will beep three times to indicate that it has performed its self test ok.

- If it does not beep at all, check that the cable is correctly plugged in and there are no breaks in the cable. Also check that your batteries are properly inserted and fully charged.
- If it beeps a fourth time, this indicates that a key is being held down, either by the keypad surround being too tight, or by damage to the keypad switch.

<u>Single Wireless Keypads</u>

If you have a single keypad that will be used to wirelessly control BOTH lanes in the pair, then you must first set the Channel Number on both the Rotary DIP V Z L W F K H V W R = H U R R Q W K H ¶ V V Z L W F K D Q Once this is done, the keypad will send out a signal to the Duo CPU module whenever a key is pressed, without specifying Odd or Even Lane.

<u>Note:</u> If you change the channel number on the Keypad PCB, then you must re-boot it by unplugging the cable from the LLAN IN port and then plug it back in.



Dual Wireless Keypads

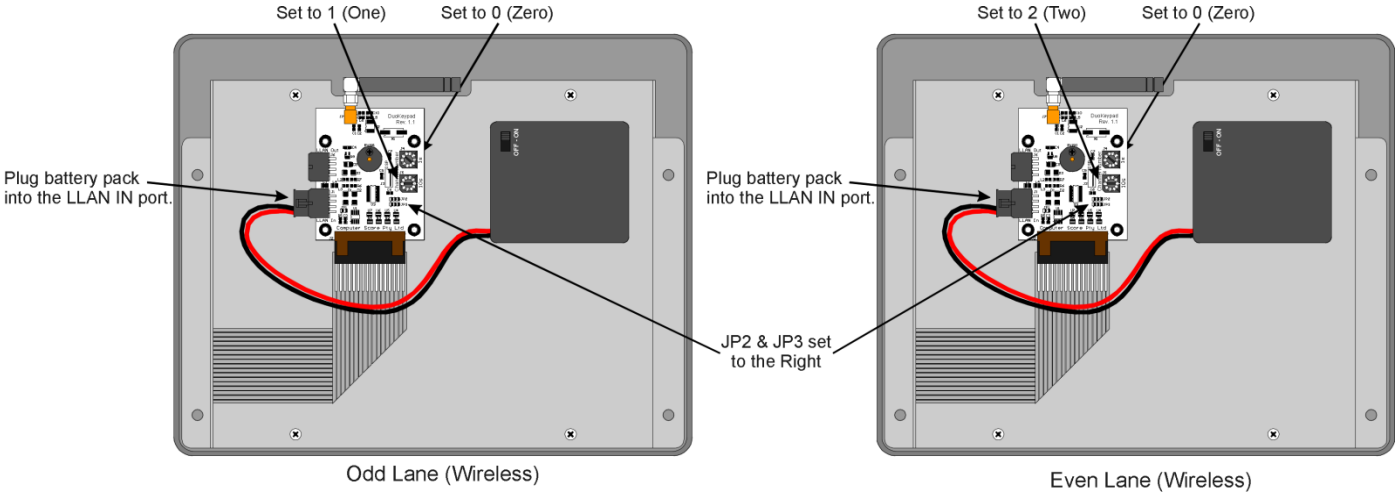
If you have dual keypads that will be used to wirelessly control one lane per keypad, then you must first set the following channel numbers:

Odd Lane: Set the Channel Number on both the Rotary DIP switches to 10

Even Lane: Set the Channel Number on both the Rotary DIP switches to 20

Once this is done, each keypad will send out a signal to the Duo CPU module, stating that the keystroke was for the odd or the even lane.

Note: If you change the channel number on the Keypad PCB, then you must re-boot it by unplugging the cable from the LLAN IN port and then plug it back in.


Set to 1 (One)
Set to 0 (Zero)
Plug battery pack into the LLAN IN port.
JP2 & JP3 set to the Right
Odd Lane (Wireless)
Set to 2 (Two)
Set to 0 (Zero)
Plug battery pack into the LLAN IN port.
Even Lane (Wireless)

Power On !

Once you have verified that all the cables are correctly plugged in and the keypad channel numbers are set correctly, you are ready to turn the system on.

Turn on power via your circuit breakers and make sure that your monitors are on. Then turn on the Duo CPU module via its power switch.

Duo CPU Module

You should be able to hear the cooling fan in the Duo CPU Module turning and see the Duo CPU unit booting on the screens.

Duo Camera Module

If installed, you should see the MCU activity and LLAN activity LEDs flashing on the Duo Camera Module (If fitted) See below for the position and function of the LED Indicators on the Duo Camera Module.

If the Ball Detectors have not yet been correctly adjusted, then you would also see a red LED on the end of the ball detector for each lane. See below for how to adjust the Ball Detectors correctly.

Duo Keypad

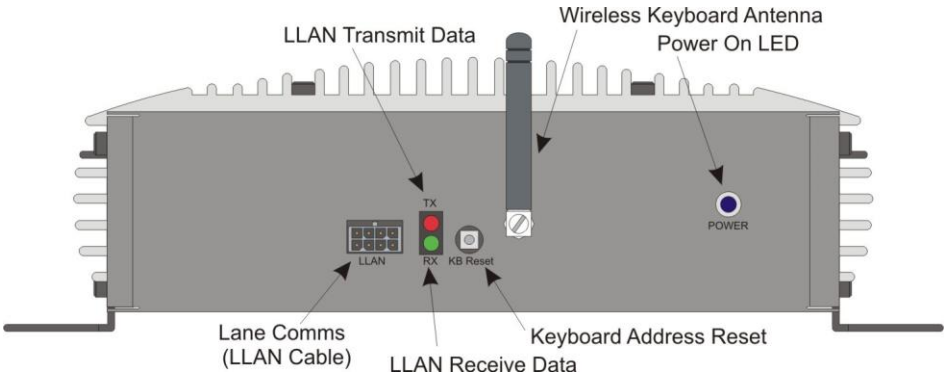
If your keypads are wired, then the keypad will beep three times to indicate that it has performed its self test ok.

- If it does not beep at all, check that the cables are correctly plugged in and there are no breaks in the cable.
- If it beeps a fourth time, this indicates that a key is being held down, either by the keypad surround being too tight, or by damage to the keypad switch.

If your keypads are wireless, then they will make no beeps when the Duo CPU is switched on.

Resetting the Wireless Keypad Channels

If you have wired keypads installed, skip this section. If you have wireless keypads installed, then your Duo CPU Module probably does not know which keypad to listen to and which of the neighboring O D Q H ¶ V N H \ S D G V W Before correct keypad operation can start you must first reset the wireless channel on the Duo CPU Module. Each Duo CPU Module can accept up to two keypads.



To assign the keypads to the Duo CPU Module:

1. Make sure your keypads have the right Channel Number set, as explained above.
2. Press the Keyboard Address Reset Button. The Duo CPU Module will then be placed into keyboard address mode and listen for any keystrokes for the next 10 seconds before timeout. During this time, both the LLAN Transmit and Receive Data lights will flash together.
3.
   i. If dual keypads are fitted, press any key on one Keypad and then press any key on other keypad.
   ii. If a single keypad is fitted, press any key on the keypad twice.
4. Test the keypads to make sure that they are correctly working. If a key on a neighboring lane ¶ V N H \ S D G Z D V S U H V V H G E H I R U H W K H S U R F H G X U H Z that keypad may have been assigned to the Duo CPU Module instead of the correct keypad. If this is the case, then just repeat the above procedure.

Note: You must repeat this procedure every time you change the battery in the keypad.

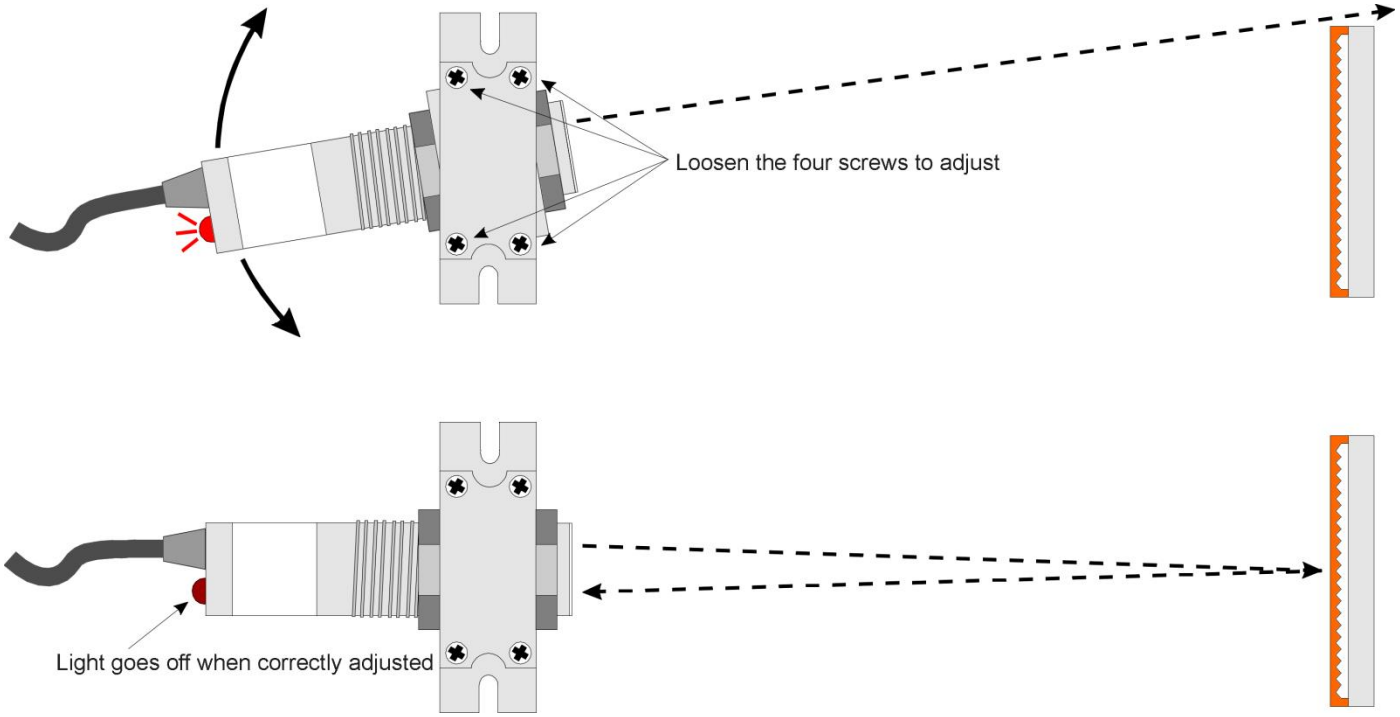
Adjusting the Ball Detectors

The ball detectors within the Duo Camera Module are designed to validate the score so that a score is reported to the monitors only when a ball is actually bowled. Therefore, if a pinsetter is cycled from the cycle button at the ball return without bowling, no false scores will be displayed.

In order to function, the ball detectors must first be adjusted so that the beam of light from the detector hits the reflector mounted on the thin capping and bounces back to the detector.

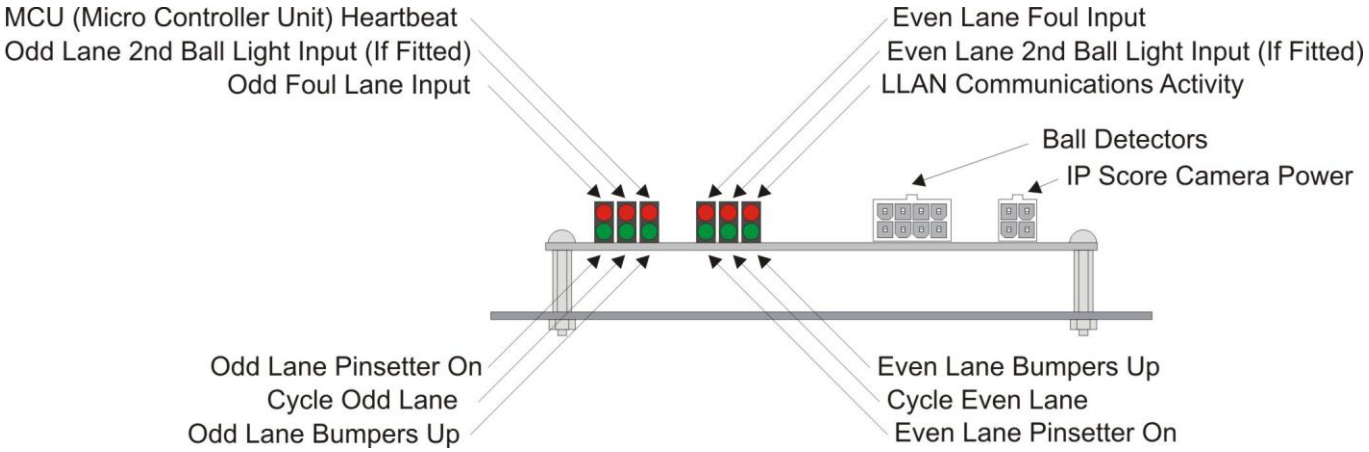
- When the unit is properly adjusted, then LED indicator on the end of the detector will be off. Whenever a ball goes past, the LED indicator will flash on and then off again.
- If the detector is not adjusted properly, then the LED indicator will remain on. This will result in no scoring being displayed at all.
- If the detector is adjusted poorly, you may notice that the response of the LED is sluggish, so that the LED goes off only sometime after the ball has gone past.

To adjust the ball detectors, loosen off the four screws at the top of the eyeball bracket and rotate the ball detector up and down, side to side until you can see the angles from which the LED will go off. Then centre the detector into the middle of this detection envelope and re-tighten the four screws.



Duo Camera Module LED Indicators

The LED indicators on the Duo Camera Module show the various input and outputs that are currently active and affecting the Duo Hardware.


MCU (Micro Controller Unit) Heartbeat
Odd Lane 2nd Ball Light Input (If Fitted)
Odd Foul Lane Input
Even Lane Foul Input
Even Lane 2nd Ball Light Input (If Fitted)
LLAN Communications Activity
Ball Detectors
IP Score Camera Power
Odd Lane Pinsetter On
Cycle Odd Lane
Odd Lane Bumpers Up
Even Lane Bumpers Up
Cycle Even Lane
Even Lane Pinsetter On

Output LEDS

Outputs are defined as situations where the Duo system is telling other hardware to act. (Eg. Turn on the Machine) These LEDs are all green and are all on the bottom row.

- Pinsetter On — This output LED signifies when the Duo Hardware has activated the machine. Whenever this LED is on, the Pinsetter should also be on, unless the switches at the rear of the Pinsetter or at the Managers Control Desk have manually turned it off.
- Cycle Lane — This Output LED will light every time the Duo Hardware sends a cycle command to the machine.
- Bumpers Up — This Output LED will be lit whenever the Automatic Bumper system should be raised.

Input LEDS

Inputs are defined as situations where the Duo system is being told by other hardware that something has happened. (Eg. A Foul has occurred.) These LEDs are all red and are all on the top row.

- Foul Input — This Input LED indicates that the Duo Unit is receiving a Foul signal either from the Foul Unit (If connected) or from the machine itself with high level pinsetters such as the 82-90Xli and GS series. If throw a foul ball, then this LED will be lit for a few seconds.
- 2nd Ball Light — This Input LED indicates that the Duo Unit is being told that the machine is on second ball via an optional connection to the 2nd Ball Light on the Masking Unit. This is only done with AMF 82-70s with MP chassis, 82-70s with MK expander and 82-90 Pinsetters and overcomes problems with the short cycle in these particular Pinsetters. If the Pinsetter is on second ball (and the second ball light input is fitted) then this LED will be on.

Diag LEDS

Diag LEDs are used to give additional information on the system activity of the Duo Camera Module. Both these LEDs are red and are on the top right corner of each bank.

- MCU Heartbeat — This indicator shows that the Micro Controller Unit of the Duo Hardware Module is functioning at a hardware level. This LED is used for system diagnosis purposes only.
- LLAN Activity — This indicator flashes whenever data is being communicated via the LLAN cable. This LED is used for system diagnosis purposes only.

Note: The MCU and LLAN LEDs will not flash at the same time or at the same rate. This is not a concern. You should only be concerned if these LQGLFDWRUV GRQ¶W IODVK DW DOO

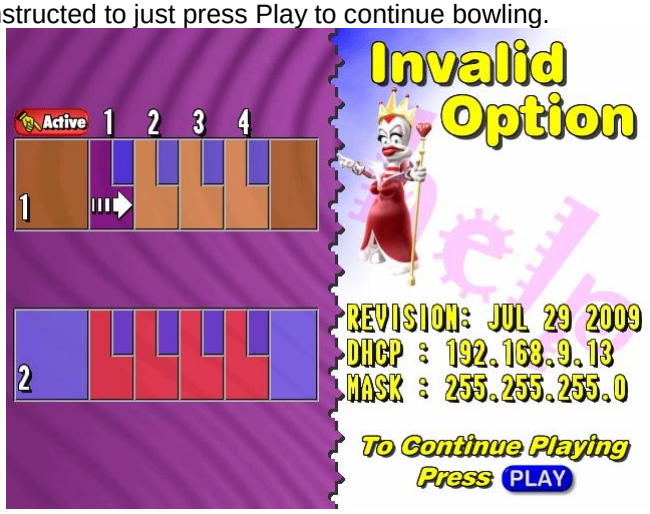
&KDSWHU 8VLQJ WKH 6HWXS :L]DUG

Starting the Wizard

In order for the Duo Hardware Module to start scoring, it must first be configured so that it knows what lane number it is, what type of Pinsetting machine is in the center, and the Ball Speed Detectors must be calibrated.

To enter the configuration screen, do the following steps:

1. Start a game by typing the number of players present (Say 1 or 2) and pressing the ***Play*** button.
2. Accept the default player numbers by pressing ***Play*** again.
3. Now press the ***Help*** button and the letter ***C*** (Standing for Configure) and the following screen should be shown. This screen is shown so that if a member of the public were to accidentally find their way to this screen, they are instructed to just press Play to continue bowling.



4. Now while this screen is displayed, type the default password of ***1507*** to enter the setup wizard.

Note: *Once the system installation has been completed, you can specify your own PIN number. This is done from the* **Center Setup** *tab of the* **Control Setup** *Screen, which can be found in the* **System Management** *menu of the Center Command software. It is HIGHLY RECOMMENDED that you then use this new PIN and leave 1507 for use ONLY when the system is not connected to the computers.*

5. The next screen is a Welcome screen, which allows you to select either the Setup Wizard or the Troubleshooting screens. Ignore the Troubleshoot option for now, as this will be covered in the next section. This screen also displays the current version date of the Duo Software for diagnostic purposes. Select your desired language by pressing the ***L*** key repeatedly. To start the wizard, press the ***Move Cursor Left*** button.

Note: On any step of the Setup Wizard, pressing the ***Move Cursor Left*** button will skip it, without modifying any of the information already entered on the screen.

Step1: Set Lane Numbers

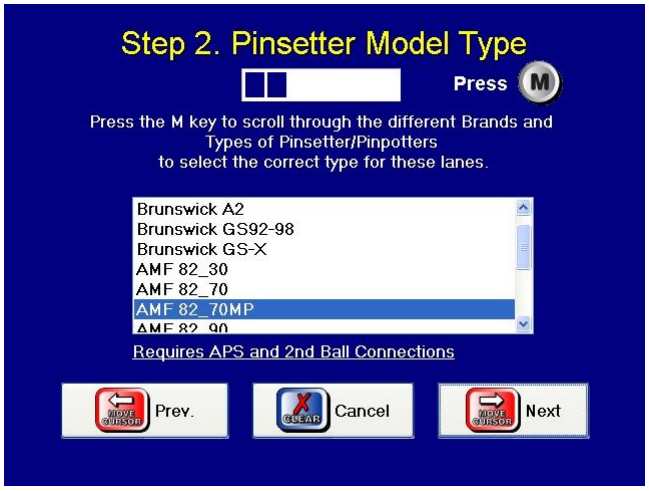
The first step of the Setup Wizard allows you to set what lane the Duo unit is on. The Duo Hardware Module must know which lane it is on in order to function in conjunction with the other lanes. There can only be one Duo unit set to any lane pair. If there are two units with the same lane numbers, then both of these units will not network to the host computers (If installed) until the lane numbers are correctly specified. To do this, type the lane number of the Odd lane of the pair. Make sure you use two numbers.

Step 1. Set Lane Numbers
Type the Number of the Left Hand Side Lane.
This will be an Odd Number, eg. 1,3,5,7,9..29..etc.
Use two numbers, e.g. 01 or 29
Odd Lane Number 03
Even Lane Number 04
Prev.
Cancel
Next

For Example: If you are configuring lanes 3 & 4, type ***03*** as the Odd Lane Number and press the ***Move Cursor Right*** button to go to the next step.

Step 2: Pinsetter Model Type

Step 2 of the Setup Wizard will allow you to specify what type of pinsetter is being used for that lane pair. The Duo unit needs to be told which type of Pinsetter Machine is installed at your center because the different types of machine behave differently from each other and so the Duo unit must alter its scoring behaviour appropriately.



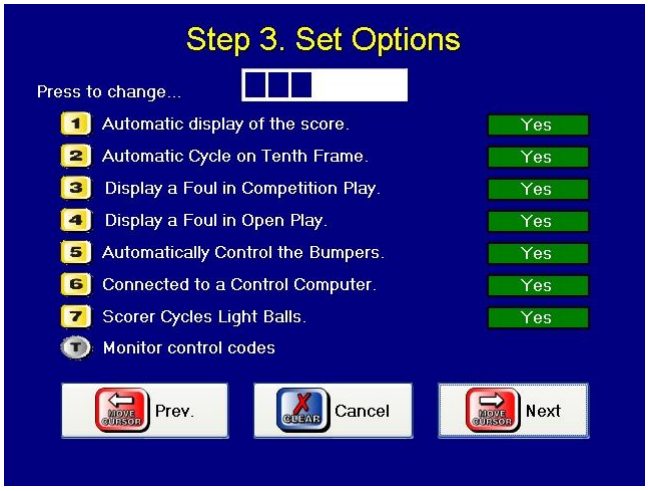
Each machine type also includes extra information to provide clues as to the unique behaviour of each type of machine. This is displayed just below the machine list.

Press the ***M*** key until the correct machine type is highlighted, and then press the ***Move Cursor Right*** button to go to the next step.

Note: *If your pinsetter is an AMF 82-70 with the MK Expander, make sure that the Pinsetter Model Type in the Setup Wizard is set to* ***AMF 82_70MP****. The MP Chassis and the MK Expander behave in the same way, so the one Pinsetter Model Type will operate both types of chassis.*

Step 3: Set Options

The third step of the Setup Wizard is the Set Options screen. The Set Options screen controls all aspects of how the Duo Unit behaves and what additional equipment is connected to the Duo unit. Each option can be toggled on and off by pressing the appropriate button for the desired option.


Step 3. Set Options
Press to change...
1 Automatic display of the score. Yes
2 Automatic Cycle on Tenth Frame. Yes
3 Display a Foul in Competition Play. Yes
4 Display a Foul in Open Play. Yes
5 Automatically Control the Bumpers. Yes
6 Connected to a Control Computer. Yes
7 Scorer Cycles Light Balls. Yes
T Monitor control codes
Prev.
Cancel
Next

These options include:

Automatic display of the score

Disabling the Automatic Scoring will cause the Duo Hardware to ignore all scores and only allow score entry from the keyboard. Automatic scoring is usually left enabled, but occasionally the need might arise to disable it for coaching purposes or in a faulty scoring situation.

Automatic Cycle on Tenth Frame

If a spare is bowled in the Tenth frame, the bowler can bowl the bonus third ball for this frame. The Tenth Frame &\FOH VHWWLQJ VHWV WKH 'XR¶V EHKDYLRXU LQ WKLV VLWXDWLRQ

If you have your cycles connected to the Duo Hardware via the Machine Interface Port or the Machine Communications Port, then the Tenth Frame Cycle should be enabled. In this situation, the Duo will cycle the Pinspotter a second time for Brunswick A, A2, AMF 82-30 and 82-70 machines. For all other advanced machines, the Duo will perform a Short Cycle directly to first ball.

Note: *If you do not have any cycle cables connected, then the Tenth Frame Cycle option should be disabled. In this case the Duo will display a sign on the monitors asking the bowler to either bowl another ball (The Score from which is ignored) or press the cycle button at the ball return.*

Display a Foul in Competition Play

7KLV RSWLRQ GHILQHV WKH 'XR¶V EHKDYLRXU ZKHQ D)RXO LV GHWHFWHG will automatically perform a foul cycle when the Pinsetter detects that a foul has been bowled. In this case the Display Foul option should be enabled so that an F will be shown on the scoregrid for that bowler. The Foul Units can then be turned on and off at the managers control desk as desired.

It is only Brunswick A and A2 machines that do not have a foul cycle. In this case, you have the option to show the F on the scoregrid or ignore it by disabling this setting. It is most common to Enable the setting for Competition Play.

Display a Foul in Open Play

7KLV RSWLRQ GHILQHV WKH 'XR¶V EHKDYLRXU ZKHQ D)RXO LV GHWHFWHG of Pinsetters will automatically perform a foul cycle when the Pinsetter detects that a foul has been bowled. In this case the Display Foul option should be enabled so that an F will be shown on the scoregrid for that bowler. The Foul Units can then be turned on and off at the managers control desk as desired.

It is only Brunswick A and A2 machines that do not have a foul cycle. In this case, you have the option to show the F on the scoregrid or ignore it by disabling this setting. It is most common to Disable this setting for Open Play so that the Foul Units can be left on to try to stop members of the public over stepping the foul line and slipping on the lanes.

Automatically Control the Bumpers

This option tells the Duo software whether there are any automatic bumper systems being controlled by the system. Automatic bumpers are either controlled via a relay switch closure across pins 4 and 12 in the Machine Interface Port (Usually AMF Bumpers systems) or by a central controller connected to the host computer (Usually Brunswick Bumper systems). For more information on centrally controlling bumper systems such as Brunswick Ball Wall, see Appendix B.

If this option is enabled, then the system will display a Bumper Icon for any bowler who has bumpers specified from the Control Computer.

Connected to a Control Computer

Aside from their Stand Alone functionality, the Duo hardware is able to connect to optional computers on the front desk to allow you to control all aspects of the lanes from the front counter, as well as the other optional software modules such as Point Of Sale and League Secretary. In order to use these features the Duo hardware must be told to look for the presence of the front end computers.

If control computers are present, enable this setting. If the Duo units have no computers attached and are operating in Stand Alone mode, disable this setting.

Scorer Cycles Light Balls

7KH GHVLUH IRU /LJKW %DOO 7ULJJHULQJ FRPHV IURP WKH VLWXDWLRQ ZKHUH HQRXJK IRUFH WR DFWLYDWH WKH EDOO GHWHFWRU LV EHLQJ DSSOLHG WR WKH EDOO DV LW UROOV GRZQ WKH ODQH 0RVW 3LQVHWWHU 3LQVSRWWHU PDFKLQHV LQFOXGLQJ WKH TQS series already include an electronic sensor to detect the ball and perform a cycle automatically. In this case, disable Light Ball Triggering in the Set Options screen. However, older Pinsetter models may not include this feature.

Although the Duo system does not need to have light ball triggering in order to report the score, it does have the ability to cycle the machine on a time delay after the ball passes the ball detectors built into the Duo Hardware Module.

Light Ball Triggering Safety

Once you enable this feature you are presented with a Warning screen regarding the safety of any light ball triggering system. You must read this message in full by pressing on the ***M*** for ***Read More*** button.

Important Safety Message !
Light Ball Triggering in NOT required by this Scoring System.
Enabling this feature will result in the Pinsetter/Pinspotter being cycled a time delay period after the Ball Detection beam at the Score Camera has been cut.
The manufacturer of this equipment does NOT require Light Ball triggering in order to determine and report the score.
If Light Ball Triggering is enabled it is the sole responsibility of the proprietor of this center to initiate and maintain all necessary safety systems to protect the safety of all persons within this center. Such safety systems include, but are not limited too.
1. Appropriate Warning Signs.
2. Written and enforced procedures in regards the safe
ENTER
I Accept
CLEAR
I Decline
M
Read More

Once this is done, the ***I Accept*** option becomes enabled.

The full text of this warning is as follows:

Light Ball Triggering in NOT required by this Scoring System.

Enabling this feature will result in the Pinsetter/Pinspotter being cycled a time delay period after the Ball Detection beam at the Score Camera has been cut.

The manufacturer of this equipment does NOT require Light Ball triggering in order to determine and report the score.

If Light Ball Triggering is enabled it is the sole responsibility of the proprietor of this center to initiate and maintain all necessary safety systems to protect the safety of all persons within this center. Such safety systems include, but are not limited too,

1. *Appropriate Warning Signs.*
2. *Written and enforced procedures in regards the safe operation of the Pinsetters/Pinspotters.*
3. *Training of all staff in safe operating procedures.*
4. *Device(s) capable of monitoring unauthorised personnel approaching the pinsetters/pinspotters.*

The manufacturer does not accept any liability whatsoever for the operation of Light Ball Triggering and merely provides this feature upon the discretion of the proprietor of this center. He/she must make themselves aware of all possible consequences of this method of triggering the pinsetter/pinspotter, BEFORE enabling this feature.

This feature is to be enabled by an authorized representative of the proprietor of this center only.

The proprietor of this center is advised to seek advice from his/her attorney prior to enabling this feature.

By choosing to accept these conditions the proprietor of this center is agreeing to them.

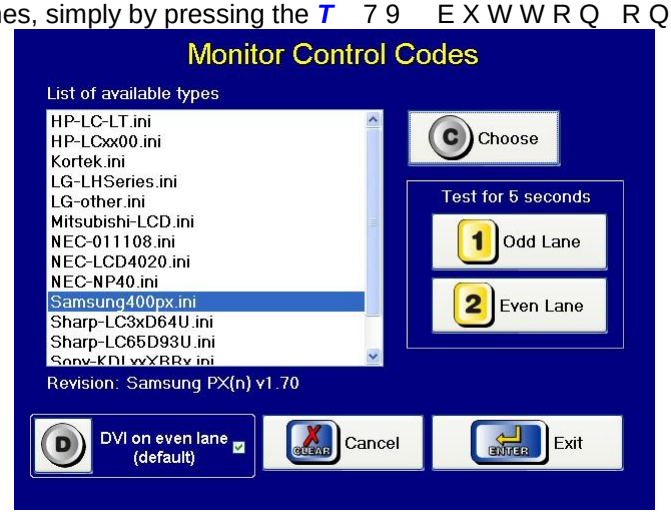
As with any light ball triggering system, moving machinery will be automatically activated whenever the ball detector beam is cut. It HIGHLY RECOMMENDED that you DO NOT use Light Ball Triggering UNLESS you have properly thought out, acted and accepted all its implications.

Note: If Light Ball Triggering is enabled, a cycle signal will NOT be sent to the Pinsetter in the following situations:

1. If the Ball Detector beam is cut twice.
2. If the Ball Detector beam is cut for a long time. (Approx 2 seconds)

Monitor Control Codes

The Duo CPU Module includes the ability to send control codes to the monitor, via a RS-232 serial connection. This allows the Duo CPU to communicate to the monitor and direct it to switch inputs to and from AV1, this allows the bowlers to watch TV on the lanes, simply by pressing the ***T*** 7 9 E X W W R Q R Q W K H E R Z O H U ¶ V N H \ S D



This screen shows a list of predefined control codes for various manufacturers. It allows you to scroll through the list using the ***C*** button and then perform a 5 second TV test by selecting either ***1*** for the Odd Lane and ***2*** for the Even Lane.

Unfortunately there is no standard set of control codes used by all monitor manufacturers, so trial and error is required. If none of the options work, then contact your Computer Score representative with the make and model number of your monitor.

Press the ***Enter*** button to Exit when finished. This will return you back to Step 3.

Step 4: Calibrate Odd Lane Ball Speed

The forth step of the Setup Wizard allows you to calibrate the Ball Detectors on the odd lane so that an accurate ball speed can be determined whenever a ball goes past the Duo Hardware Module.

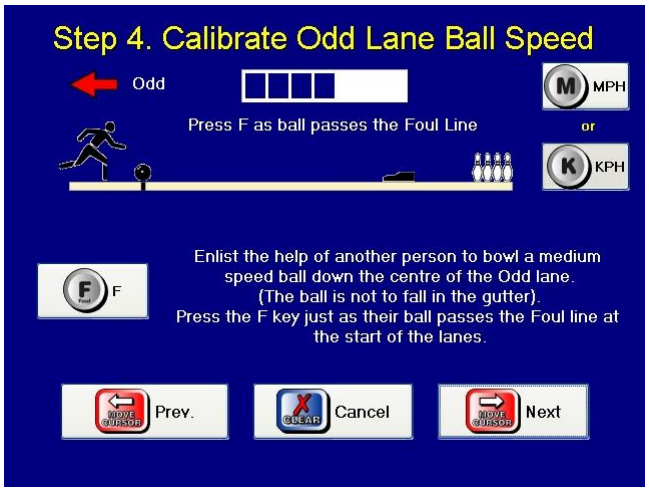
,W LV QHFHVVDU\ WR DFFXUDWHO\ FDOLEUDWH WKH %DOO 'HWHFWRUV capture timings based upon the speed of the ball.

Press the ***M*** key to display the ball speed in Miles per Hour or press the ***K*** key to display the ball speed in Kilometres per Hour.

In order to perform this step you will need the help of another person to bowl a medium paced ball down the center of the Odd lane, while you time its travel by pressing the ***F*** key when the ball passes the Foul Line.

To set the Odd Lane Ball Speed:

1. Get ready to press the F key
2. Tell the bowler to bowl
3. Press ***F*** at the moment the ball passes the foul line
4. The screen with then count the seconds as the ball is travelling down the lane
5. When the ball passes the Ball Detectors, the speed is determined


Step 4. Calibrate Odd Lane Ball Speed
Odd
Press F as ball passes the Foul Line
MPH
or
KPH
F
Enlist the help of another person to bowl a medium speed ball down the centre of the Odd lane.
(The ball is not to fall in the gutter).
Press the F key just as their ball passes the Foul line at the start of the lanes.
Prev.
Cancel
Next

Note: If this procedure has already been done previously, and you are satisfied with tKH %DOO 6SHHG¶V DFFXUDF\ \RX FDQ ***Move Cursor*** WKLV VWHS SU ***Left*** button, without pressing ***F***.

Step 5: Calibrate Even Lane Ball Speed

The fifth step of the Setup Wizard allows you to calibrate the Ball Detectors on the even lane so that an accurate ball speed can be determined whenever a ball goes past the Duo Hardware Module.

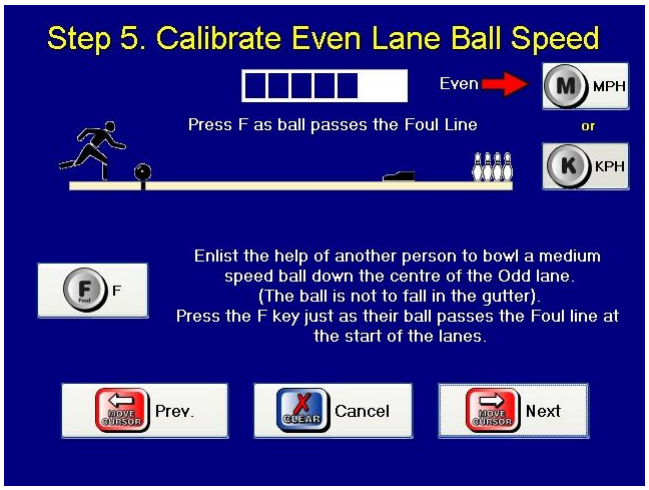
,W LV QHFHVVDU\ WR DFFXUDWHO\ FDOLEUDWH WKH %DOO 'HWHFWRUV capture timings based upon the speed of the ball.

Press the ***M*** key to display the ball speed in Miles per Hour or press the ***K*** key to display the ball speed in Kilometres per Hour.

In order to perform this step you will need the help of another person to bowl a medium paced ball down the centre of the Even lane, while you time its travel by pressing the ***F*** key when the ball passes the Foul Line.

To set the Even Lane Ball Speed:

1. Get ready to press the F key
2. Tell the bowler to bowl
3. Press F at the moment the ball passes the foul line
4. The screen with then count the seconds as the ball is travelling down the lane
5. When the ball passes the Ball Detectors, the speed is determined


Step 5. Calibrate Even Lane Ball Speed
Even
M MPH
Press F as ball passes the Foul Line
or
K KPH
F
Enlist the help of another person to bowl a medium speed ball down the centre of the Odd lane.
(The ball is not to fall in the gutter).
Press the F key just as their ball passes the Foul line at the start of the lanes.
Prev.
Cancel
Next

Note: If this procedure has already been done previously, and you are satisfied with WKH %DOO 6SHHG¶V DFFXUDF\ \RX FDQ ***Move Cursor Left*** button, without pressing ***F***. WKLV VWHS S

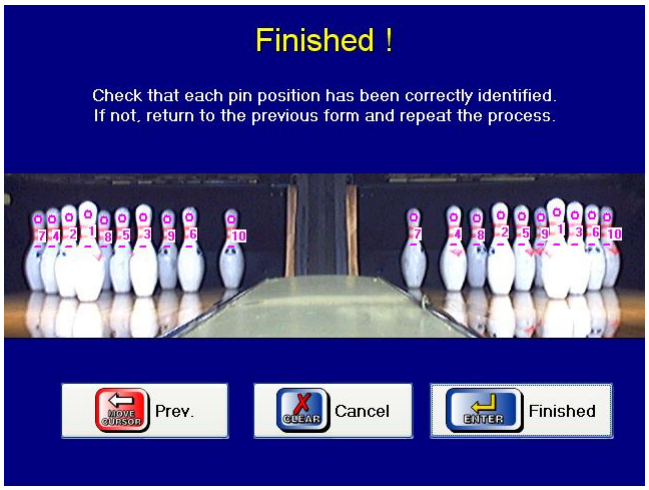
Step 6: Adjusting the Scoring Camera

The sixth step in the Setup Wizard shows the current real time image from the camera and allows you to verify that the camera is positioned straight and level to the pins. The image has a cross hair superimposed over the pins. Press the ***C*** button to automatically adjust the image position to the center of the screen. If you are not satisfied with the result of the auto positioning, adjust the position of the image by pressing W to move the image up, ***Z*** to move the image down, ***A*** to move the image left or ***S*** to move the image right. The desired images should look similar to the image below.

When you are satisfied with the image, press the ***Move Cursor Left*** button to continue.

Finished !

The final screen in the Setup Wizard shows the results of the camera configuration process. Verify that there is a Pin Position Marker dot on the head of every pin. The Duo software looks at this dot to see if the pin is present or has been knocked over.


Finished !
Check that each pin position has been correctly identified.
If not, return to the previous form and repeat the process.
Prev.
Cancel
Finished

If the Pin Position Markers are not correctly positioned, press the ***Move Cursor Left*** button to go back to the previous screen and try again. If you continue to have poor results from the automatic pin detection process, you set these pin positions manually using the Adjust Camera section of the Troubleshooting screen.

&KDSWHU 6HWXS WKH 2SWLRQDO &RPSXWHU

The remaining Chapters in this manual are only required if you have purchased the Center Command system management software suite. If you have not purchased Center Command, then your job should now be finished and you are ready to bowl!

You may have purchased system computers as part of your quote. If this is the case, then you will be supplied all the computers you will need. If you have elected to purchase your own computer equipment, then the following section will give you a good guide to make your purchases.

What Computer Equipment do I need to purchase?

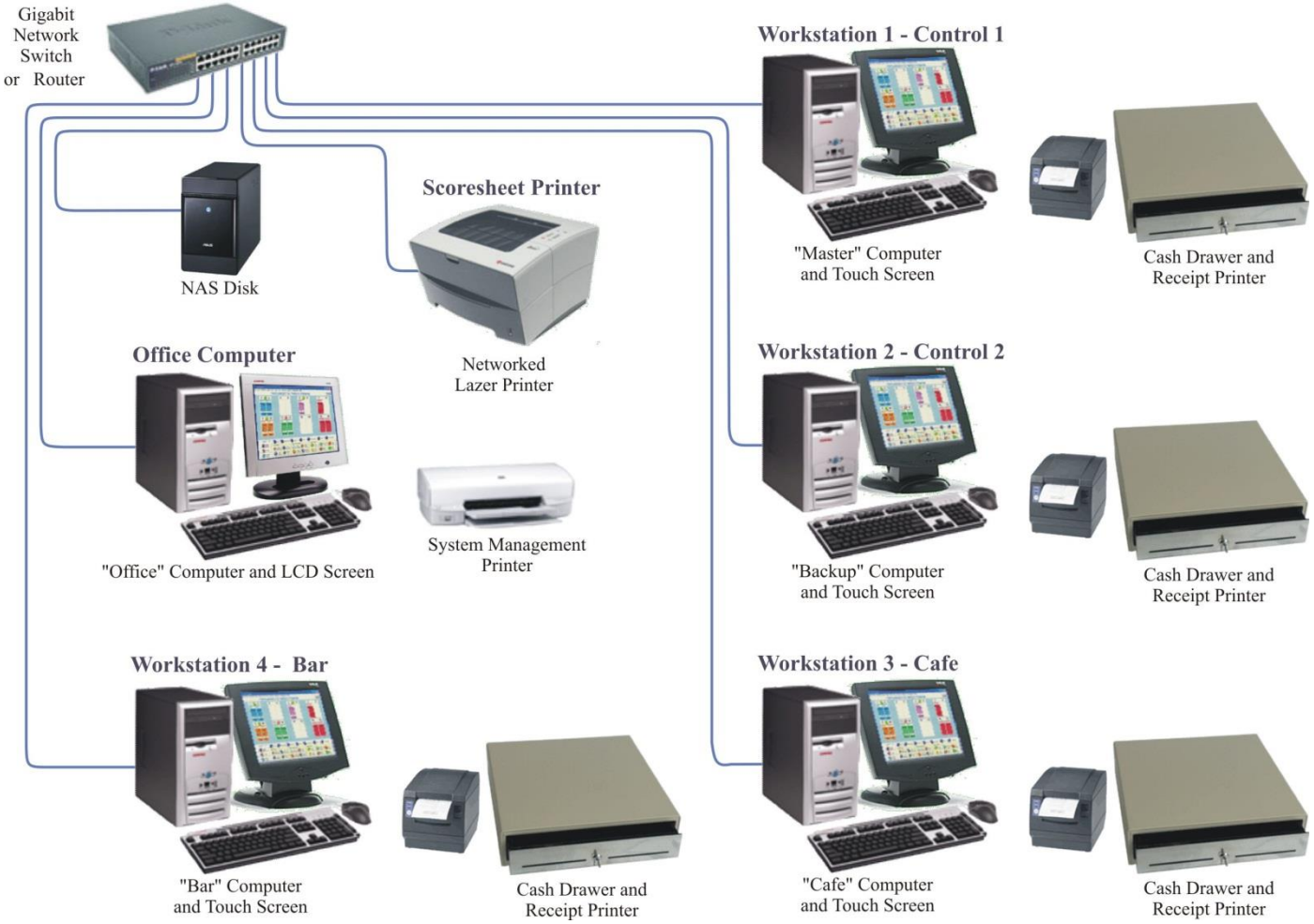
Equipment needed for each Point of Sale Workstation

- New computer running Windows XP Professional or later.
- Touch Screen LCD Monitor (Optional) or Regular LCD Monitor
- Keyboard & Mouse
- Point Of Sale Receipt Printer (If Point of Sale Module is installed)
- Cash Drawer to match the Receipt Printer (If Point of Sale Module is installed)

Equipment needed for overall system management

- Laser Printer for Scoresheets
- Network Switches
- Network Cables
- Office Computer and LCD Monitor (Optional)
- Printer for system management reports. (Optional, you could use the Scoresheet Laser for all reports)

An example of a large bowling centre with Point of Sale, two Control Counter Terminals, Café, Bar and an office computer:



Comments on purchasing Computers

Again, like the purchasing of overhead monitors, price can have a large bearing on the decision for which computer to purchase to use with the system, but the following factors should also be taken into account when purchasing computers and other hardware:

- Quality: The cheapest computer is not necessarily the best. Consider that the usual life of a scoring system is at least 10 years and that any computer that will be reliable for that length of time must be well built (and well maintained.) Beware of Cheap Systems. A computer that is for sale at a low price often contains low-end components and a flimsy case.

- Presence: Go with a supplier who is reputable and present in the local community. Although name brand computers have the advantage of being generally very well built, a reputable local supplier should be in a position to offer continuing technical support if you experience any hardware troubles.

- Speed: Obviously the quicker the better, but basically any NEW computer that will run the current version of Windows comfortably will easily run the software. There is a tendency for computer manufacturers to only supply the minimum amount of RAM to run Windows, which can lead to the computer running slower than it need be. It is recommended that each computer include at least the amount of RAM recommended for the current version of Windows.

- Operating System: The Duo system software is designed to be run on a home or small business PC running the current version of Microsoft Windows. It is recommended to use XP Professional or later, however the system will still operate using XP Home. Windows 98 or earlier is NOT recommended. Windows Vista is fully supported.

Comments on purchasing Touch Screens

Touch Screens are special LCD monitors that have driver software that you load onto your computer. They include sensors on the screen that detects your finger touching it and then act like a mouse click on your computer via a USB or Serial cable.

Touch Screens are not essential equipment for the system to function, it will work quite fine using a mouse instead. However, a Touch Screen is very professional looking and will impress your customers.

There are three basic types of Touch Screen, Capacitive, Resistive and Surface Wave:

- Capacitive Touch Screens use your finger as an earth point to detect the location of a touch on the screen. The advantage is that the screen is very clear and easy to read. The disadvantage is that only a skin touch will work, you cannot use a fingernail, pencil or gloves.
- Resistive Touch Screens use two thin layers of plastic separated by tiny plastic beads. When you touch the screen, contact is made between the two layers to determine the touch position. The advantage is that any pressure of the screen will detected as a touch. The disadvantage is that the layers of plastic and the beads make the screen slightly less clear than a capacitive screen.
- Surface Wave Touch Screens use the dampening effect of your finger on any other soft object to stop a wave being oscillated through the glass screen. The big advantage of this type is that there is no coating or overlay used that can be damaged or worn out compared to other technologies.

Any type of screen will work with the system. The decision between the three types is a personal preference. However, general consensus is that the Surface Wave technology is superior.

Comments on purchasing Receipt Printers and Cash Drawers

Receipt Printers are required only when the Point of Sale software module has been activated. They are used to print out sales receipts to your customers, either on every transaction or on demand. They also send a signal to open the Cash Drawer, which is usually plugged in to the back of the Receipt Printer.

There are two types of receipt printer, Dot Matrix Impact and Thermal. Although the Thermal Printers are slightly more expensive, they are much quicker and more reliable than the Dot Matrix printers and therefore are definitely recommended.

The system software is ESC POS (Pronounced Escape POS) compliant, so when purchasing your Receipt Printer, make sure that it is compatible to the ESC POS protocol. This protocol is a multi model, multi manufacturer VWDQGDUG RI FRPPXQLFDWLQJ WKH DGGLWLRQDO FRPPDQGV WKDW 3RLQW ³2SHQ WKH &DVK 'UDZHU´ 0RVW QHZ 5HFHLSW 3ULQWHUV DUH QRZ (6& 32

Comments on purchasing a Scoresheet Printer

$ /DVHU SULQWHU LV UHTXLUHG LQ RUGHU WR SULQW FXVWRPHU¶V VF used, although if you use a color laser printer, any header or footer image you create for the scoresheets will be printed in color. Although this looks very good, the running costs of a color laser are higher than that of a mono laser.

When purchasing a laser printer, you should also inquire as to whether the printer driver software has a reputation for being solid, simple and reliable. Unfortunately, some manufacturers have been guilty of producing VRIWZDUH WKDW LV RYHUO\ FRPSOH[DQG system resources. You should consult your computer specialist for his opinion of a simple and reliable printer.

You should also take into account the expected duty cycle of the printer. You might print more pages per month than what some cheaper printers might be designed to print. Therefore there is a higher risk that your rate of usage may wear the printer out prematurely.

The laser printer will often be connected to the main computer at the front counter via the Parallel Port or via a USB port. However, as shown in the diagram at the beginning of this chapter, you are also able to use a networked printer. The advantage of this is that it makes sure that all the Workstations contain exactly the same peripherals, which help with the simplicity of setting up and sharing printers. The other advantage is that the Scoresheet Printer no longer needs to be close to the computer. Because it is connected via Cat5 cable to the switch or router, it can be placed wherever you would like it.

Whichever connection method you use is up to your personal preference. Consult your computer specialist for more information on networked printers.

Overview of the Setup sequence

Installing the software should be the LAST thing that is done when setting your system management computers. The majority of problems encountered when setting up new system management computers involve issues with Windows networking and printers. You should ONLY install the software once you have tested and verified that ALL printers will operate from ALL computers..

The basic sequence of events is as follows:

1. Run all the Network Cable and Install the Switch or Router.
2. Install the NAS Disk
3. Network the Computers
4. Install and Share the Printers
5. Install and Configure the Software

1. Run all Cables and Install the Switch or Router

Wired computer networking currently supports two speeds: Fast Ethernet (100mbit) and the faster Gigabit Ethernet (1000mbit.)

CAT5e cable is used for Fast Ethernet and also for shorter runs of Gigabit. Alternatively, CAT6 cable, although more expensive, is designed specifically for Gigabit networking. Both CAT5e and CAT6 support a maximum cable run of 100m (328 feet)

Gigabit networking is recommended, purely because it is faster than Fast Ethernet. However, Fast Ethernet will also work quite satisfactorily. If using Gigabit, then make sure all Switches, Routers and Network Interface Cards (NICs) in the computers support Gigabit.

Use a qualified Data Cable contractor, who would be able to run the cables into difficult locations as well as properly install wall plate connectors and crimp connectors.

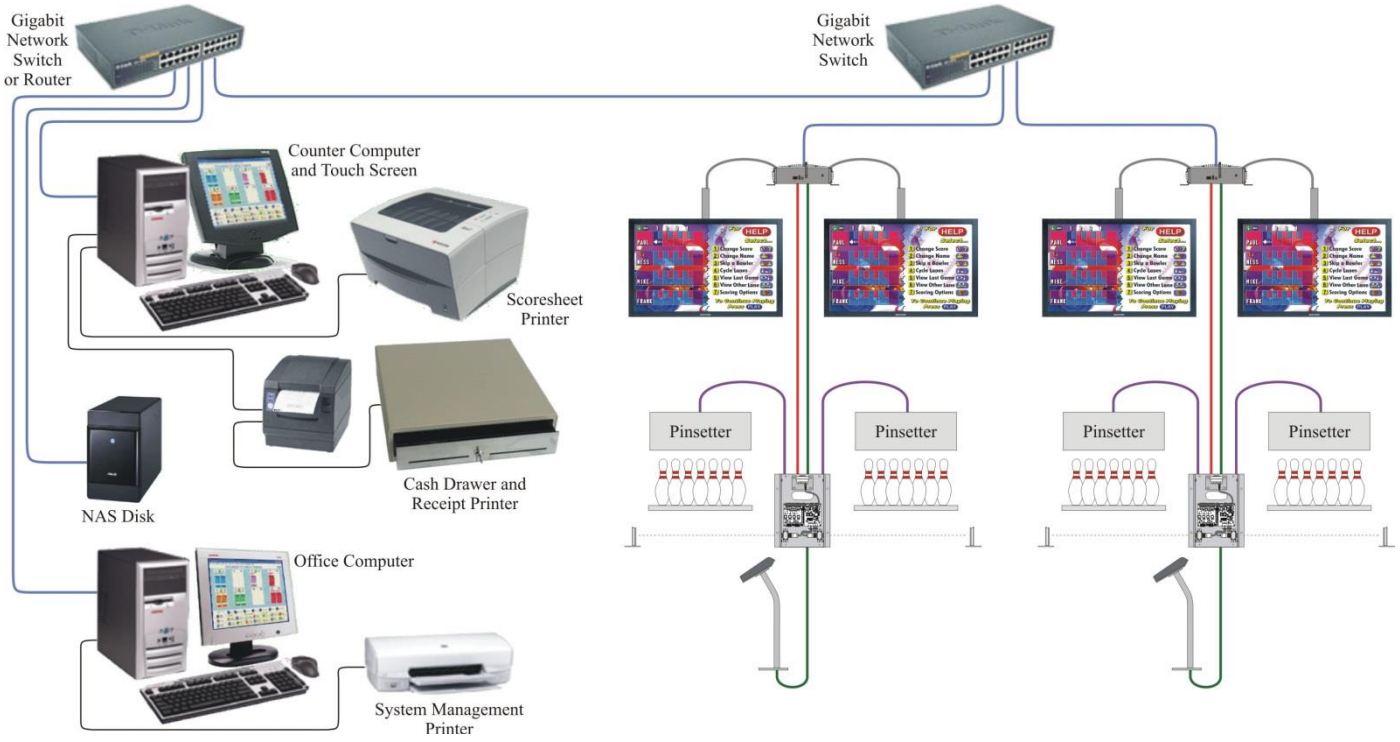
Running Cables

Run a length of cable from the switch at the curtain wall to a convenient place to locate the second switch or router. Then, run an additional cable for each computer from this position to where each computer will be placed. At this time you should consider whether you might like to add additional computers in the future and run the cables while you are at it.

Finally, run another cable to where the NAS Disk will be located.

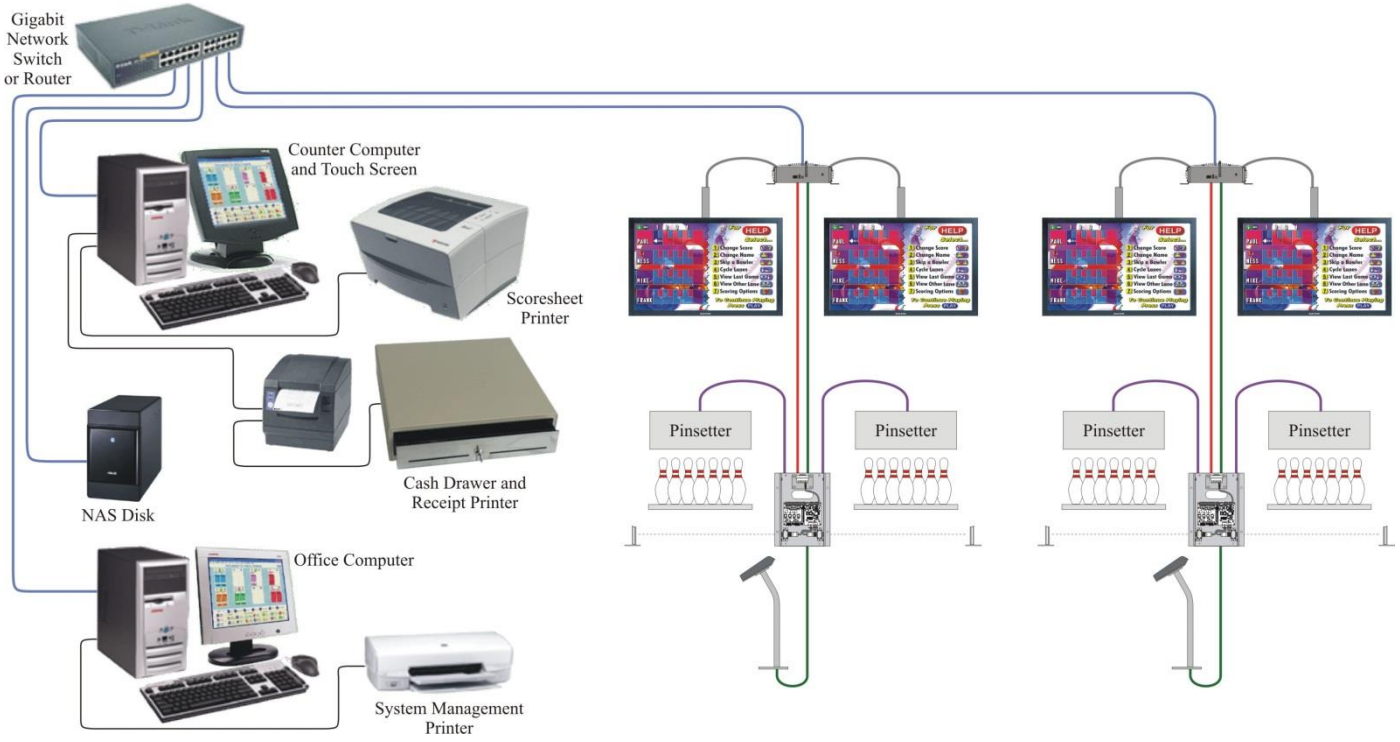
Dual Switch cabling

(Type A System shown)



Single Switch Cabling

(Type A System shown)



What is a Switch?

A network Switch was multiple connectors which allow you to plug in all the CAT5e cable from each computer, the NAS Disk and the other switch at the curtain wall (If used).

This device then acts like a telephone exchange that allows data to flow from the sending to the receiving F R P S X W H U G L U H F W O \ Z L W K R X W D O O R W K H U F R P S X W H U V K D Y L Q J W R ³O L V

What is a Router?

A Router performs all the same functions as a switch but in addition, a Router will also tell every computer what IP address it should be. This function is known as DHCP (Dynamic Host Configuration Protocol) Serving. A F R P S X W H U ¶ V , 3 D G G U H V V Z L O O E H V H W L Q W K H U R X W H U V F R Q I L J X U D W L R Q G D W D. A Router can also perform other functions such as sharing broadband Internet (if connected.)

By default, most computers are set to obtain their IP address automatically. Basically, this means that all the computers on the network must work out their IP address amongst themselves. This process can take up to one minute before a computer is then able to connect to the network and communicate to others.

The function of a Router (Amongst other things) is to streamline this process by telling each computer , Q F O X G L Q J W K H ' X R + D U G Z D U H 8 Q L W V Z K D W L W ¶ V , 3 D G G U H V V Z L O O E H communicate immediately on reboot.

Note: There can only be one Router on any network.

2. Installing the NAS Disk

What is a NAS Disk?

NAS stands for Network Attached Storage and a NAS Disk is essentially a Hard Disk Drive that is connected to the network so that all computers can communicate with it to access the software and data files.

The NAS Disk should be located in a secure position where there is no vibration and it is not in danger of being jostled or bumped. Often the NAS Disk is placed in an office or near an administration Workstation, however make sure that it is not put in an office tha W L V O R F N H G G X U L Q J W K H Q L J K W V K L I W 2 W K H U Z L V H access to it if a reboot is needed for whatever reason.

To install the supplied NAS Disk, simply plug in the Network cable and power.

Why do I need a NAS?

: L Q G R Z V K D V D U H V W U L F W L R Q F D O O H G W K H ³, Q E R X Q G & R Q Q H F W L R Q / L computers can connect or talk to a computer at one time. For Windows XP Professional, this limit is 10 and for Windows XP Home, this limit is 5.

For example, a 16 lane center will have 8 Duo units, so if you also have two computers, you have reached the 10 user limit in Windows XP Professional.

A NAS does not have this limit, so if you use a NAS drive you can connect to Computer Score from as many lanes and other computers as you would like.

Sourcing your own NAS disk

A NAS disk should be supplied with the Duo hardware, however you may wish to purchase your own NAS drive. Any NAS (Network Attached Storage) device should be able to be used. It should set up with the following settings:

1. The network name of the device must be **COMSCORE**
2. The Workgroup for the device must be called **WORKGROUP** (All Capital Letters)
3. There must be a share created called **COMSCORE** with Read / Write access to all users.
4. There must be a user account called **Solo** with a password of **Solo**. (**Note:** The username and password must have a Capital S and the rest in lower case.)

Once this is done, you can continue to follow these instructions and then finally install the software as described in Chapter 10.

Note: 7 K H ' X R V \ V W H P L V D Q H [W H Q V L R Q R I & R P S X W H U 6 F R U H ¶ V 6 same software platform. Therefore, throughout the Duo backend user interface makes reference to Solo in various places.

Creating your own NAS disk

There are also several NAS solutions aimed at transforming a standard computer into a NAS device by installing a Linux based NAS operating system. An install disk ISO image for one of these Linux solutions is in a folder on your Computer Score installation CD. This folder also contains step by step instructions on how to create the NAS device.

Contact your Computer Score representative for more information on creating your own NAS drive.

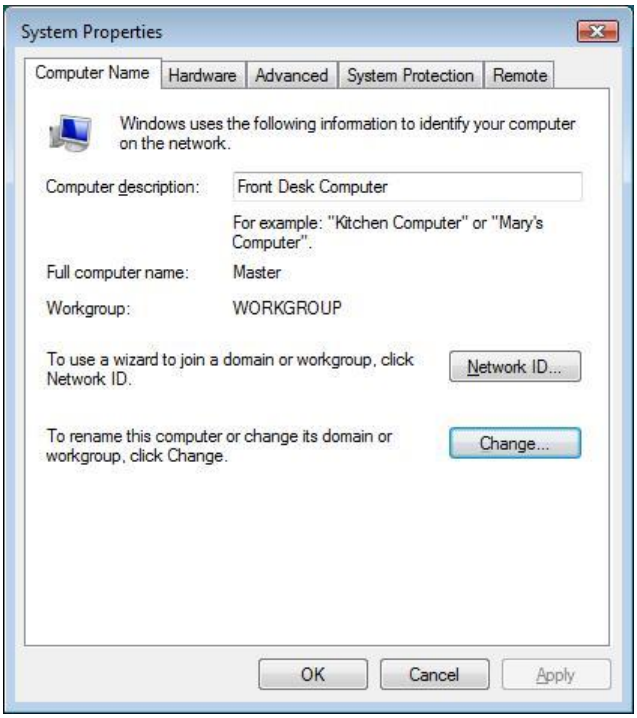
3. Networking Computers

Assuming that all your computers are set up and have windows installed and running, the next thing to do is setup networking so that the computers can share data.

In order to network computers together, obviously, every computer must have a network adaptor installed. The vast majority of new computers will include this as standard.

Naming Conventions

Each computer must have a unique name so that you can easily identify it on the network. The name and description for each computer can be entered from the System icon in the Control Panel of Windows. Enter a Computer Description in the space provided. Then click on the ***Change*** button and enter a computer name. Also make sure that the Workgroup name is WORKGROUP.



The Center Command software uses several pre-defined names to specify particular roles that each computer will take.

These include:

Name	Description
Comscore	The NAS Disk is always called COMSCORE. This is where all data is kept.
Master	If a computer is called MASTER, then it will automatically compress a copy of all the data on the Comscore NAS Disk whenever the Center &RPPDQG LV UXQ 7KLV LV NHSW LQ D VHS backup. It is highly recommended that a computer on the network be called MASTER. Aside from the NAS Disk, this computer could be considered to be the main computer of the system. Most often it is located on the front counter.
Backup	If a computer is called BACKUP, then when the Center Command software is run, it will perform a normal daily backup as per the MASTER computer and then it will restore it onto the COMSCORE folder on its own hard disk drive. This way, your data is constantly being backed up. It is highly recommended that one computer on the network is called BACKUP. However you MUST still perform regular backups to CD, USB Drive or other removable media to make sure that you do not lose any league data in the event of computer breakdown, or theft.
Cafe	If a computer is called CAFÉ or any variation, (Such as CAFE1, CAFE2 etc) then the League Secretary and Control Lanes functions are hidden from the Center Command menu. This is so that staff using the Cafe module (If Installed) are not able to accidentally ring up anything in the Bowling Point of Sale and contaminate their Cash Drawer with bowling monies.
Bar	If a computer is called BAR or any variation, (Such as BAR1, BAR2 etc) then the League Secretary and Control Lanes functions are hidden from the Center Command menu. This is so that staff using the Bar module (If Installed) are not able to accidentally ring up anything in the Bowling Point of Sale and contaminate their Cash Drawer with bowling monies.
Misc	If a computer is called MISC or any variation, (Such as MISC1, MISC2 etc) then the League Secretary and Control Lanes functions are hidden from the Center Command menu. This is so that staff using the Misc module (If Installed) are not able to accidentally ring up anything in the Bowling Point of Sale and contaminate their Cash Drawer with bowling monies.

Setting IP Addresses

,Q RUGHU WR FKDQJH WKH GHIDXOW VHWWLQJ IRU \RXU FRPSXWHU¶V DUHD LQ :LQGRZ¶V &RQWURO 3DQHO DQG WKHQ VHOHFW 3URSHUWLHV IRU the Internet Protocol (TCP/IP)

As already discussed, if you use a Router in your network, you should leave it set to ***Obtain an IP Address Automatically***. You are also able to leave this setting alone if you are using a Switch instead of a Router, just bear in mind that your computers will only network after about one minute after re-booting.

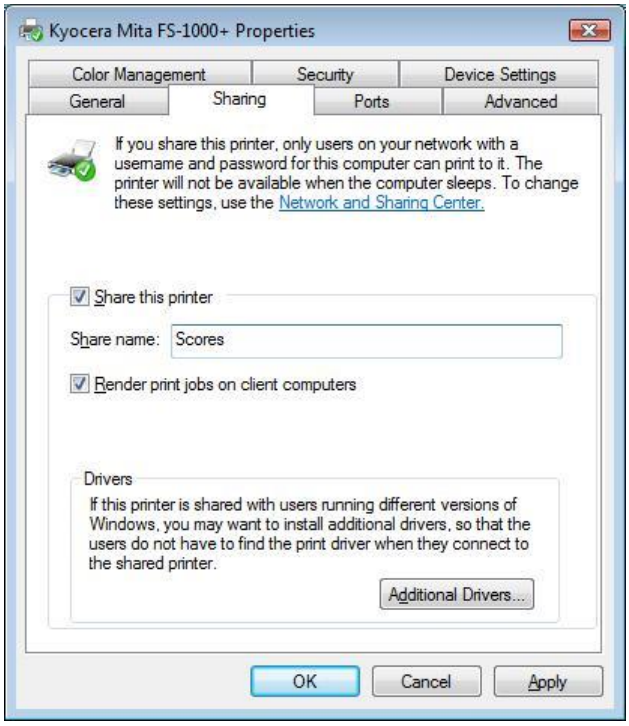
If this is not acceptable, then you also have the option to specify set IP addresses for every computer on the network. (Including the Duo Hardware units.)

For more information on setting IP Addresses or if you are unsure in any way, contact your local computer technician.

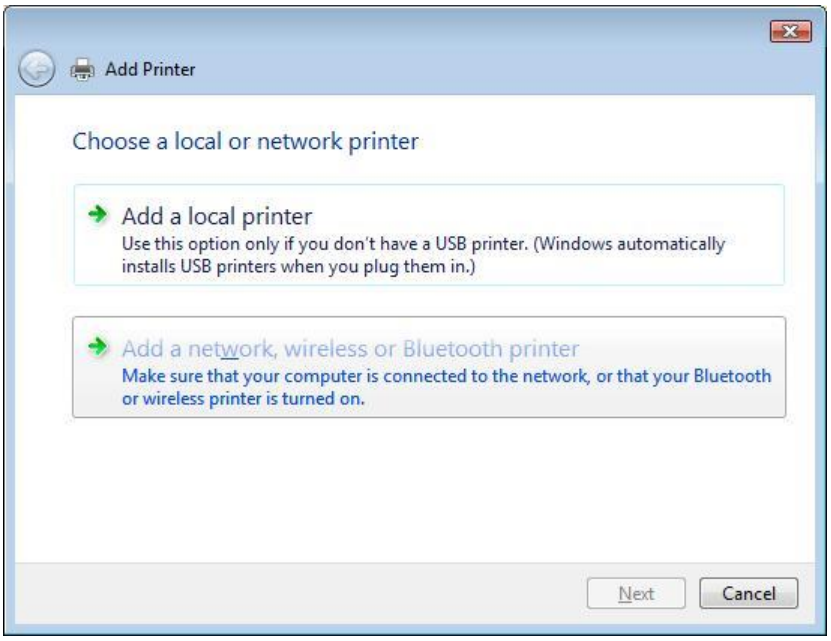
4. Installing and Sharing Printers

Installing and Networking Printers can be a challenging aspect to setting up computers. The following example assumes a printer is plugged in to a computer called MASTER and is to be installed on other computers on the network. Other printer situations may alter the installation process from this example. For more information on installing networked printers, consult your computer technician.

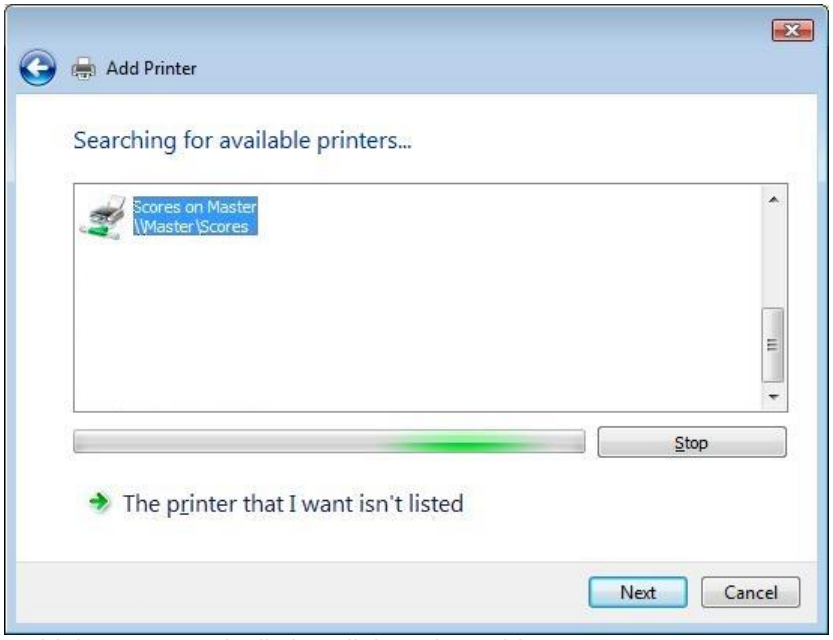
1. Install the Printer on the Local computer. You should be able to install your printers on the computer it is connected to by following the manufacturer's instructions to this printer from other computers.
2. Share the Printer. Go to the properties of the printer you wish to share and click on the Sharing Tab. Enable printer sharing and give the printer a Share Name that you will be able to remember. In this example this printer is a laser printer which will be used to have shared the printer with the share name of SCORES. In the situation where it is connected to a computer called MASTER, the full network path of this printer is \\MASTER\SCORES


Kyocera Mita FS-1000+ Properties
Color Management
Security
Device Settings
General
Sharing
Ports
Advanced
If you share this printer, only users on your network with a username and password for this computer can print to it. The printer will not be available when the computer sleeps. To change these settings, use the Network and Sharing Center.
Share this printer
Share name: Scores
Render print jobs on client computers
Drivers
If this printer is shared with users running different versions of Windows, you may want to install additional drivers, so that the users do not have to find the print driver when they connect to the shared printer.
Additional Drivers...
OK
Cancel
Apply

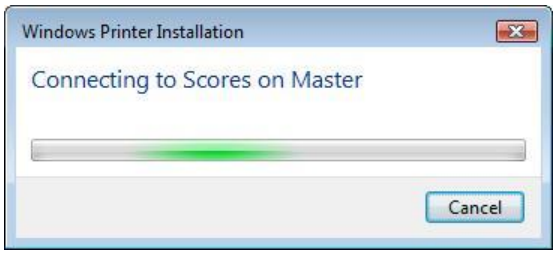
3. Install the printer driver on other computers. Use the Add Printer wizard in the Printers and Faxes section of Windows. Select the Network printer option.


Add Printer
Choose a local or network printer
Add a local printer
Use this option only if you don't have a USB printer. (Windows automatically installs USB printers when you plug them in.)
Add a network, wireless or Bluetooth printer
Make sure that your computer is connected to the network, or that your Bluetooth or wireless printer is turned on.
Next
Cancel

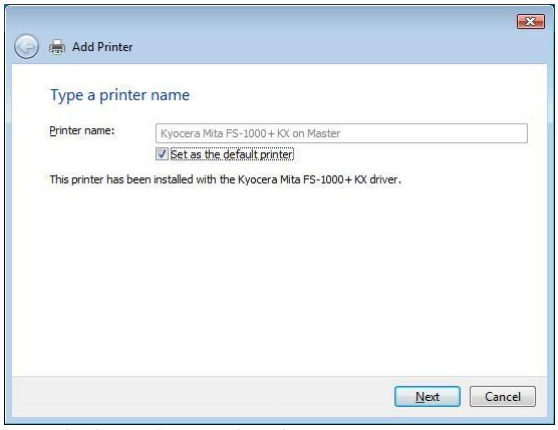
4. Then, select the desired printer from the list on detected network printers.



5. Windows should then automatically install the printer driver.



6. Set the printer as the default, only if this printer will be used to print system reports.



7. Perform a Test Print from Windows for each printer on every computer.
8. Repeat this until all computers have all shared printers installed.

6. Install the Software

Only once all the above steps have been performed and tested as working, you are then able to continue on to install the Center Command software.

This last step is discussed in the next chapter.

&KDSWHU ,QVWDOO DQG FRQILJXUH WKH 6R

Once all printers have been installed and tested and the networking connections have been tested on all computers, you can proceed to installing the Center Command software suite.

1. Install the Software on the Master Computer

Insert the installation CD into the MASTER computer and you will be presented with the following screen.

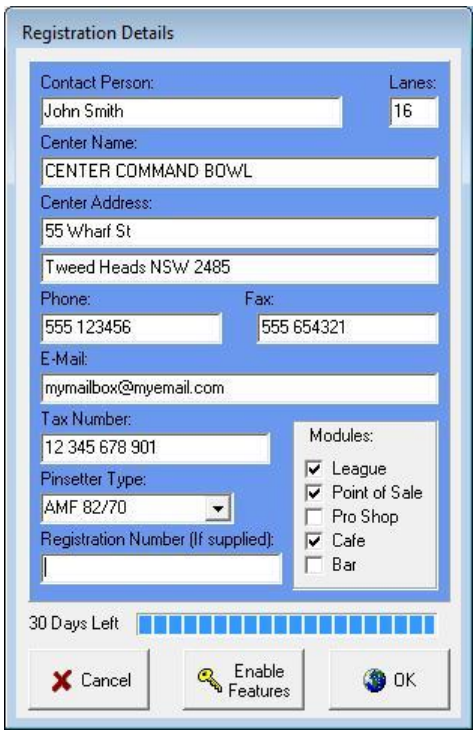
Click on the ***Full Program Installation*** button and follow the prompts to install the initial program files. Once this is done there will be a Computer Score icon on the desktop of your computer. Double click on this icon to start the software.

2. Register the Software

Once the software is running, you must then tell the computer what the name and address of the center is. To do this, click on the ***System Management*** menu button and then select ***F4 Register Software***.

Click on the ***Register*** button and enter your center ¶V GHWDLOV LQFOXGLQJ WKH H[DFW QDP your supplier for registration purposes.

Then enter the registration number as given by your sales representative and click on the ***OK*** button.



3. Install and Update the Lane Software

Exit the software back to the Windows Desktop, then Re-insert the installation CD into the MASTER computer and select the ***Lane Server Software*** option. Follow the on screen prompts and complete the installation.

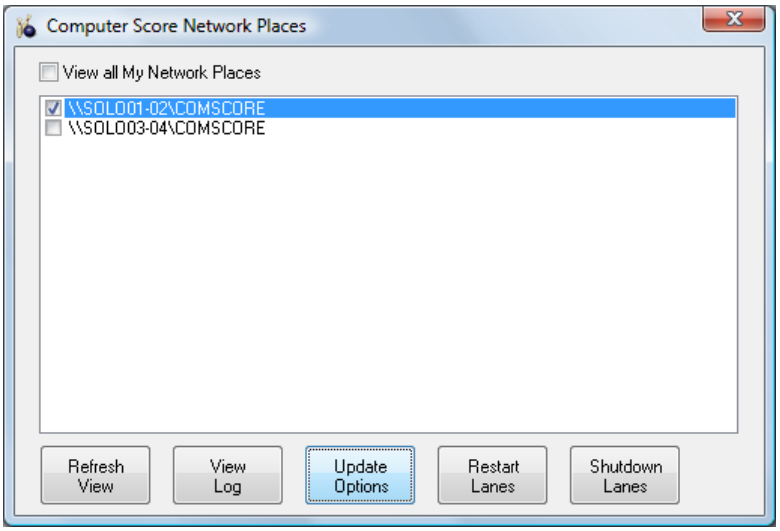
4. Update the Duo Hardware Modules

The Duo Hardware units should be pre-installed with the latest Duo operating software, however it is a good policy to update the Duo units to ensure that this is the case. The Duo units are updated by using the following procedure.

Click on the ***Go Control Lanes*** button from any main menu screen. Then click on the ***Management*** menu from the top of the screen and select ***Network***.

The following screen is then displayed showing each Duo unit that is currently corrected to the network. If you cannot see all the Duo units, then click on the ***Refresh View*** button.

Select one Duo unit only from the list and click on the ***Update Options*** button. Select the ***Include dll's*** option. Then click on the ***Update Now*** button and select the option to re-boot the unit when completed. The Duo unit will now be updated and the log below will show the files being transferred.



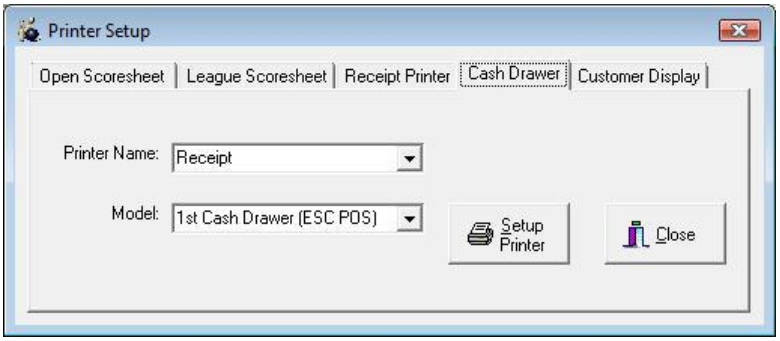
Note: 7KH 'XR V\VWHP LV DQ H[WHQVLRQ RI &RPSXWHU 6FRUH¶V same software platform. Therefore, throughout the Duo backend user interface makes reference to Solo in various places.

Note: You must wait until this process is completed before continuing. Once completed, quit back to the Control Lanes screen and repeat the process for the next Duo unit.

5. Assign Printer Functions

By default, most printing for the standard reports are merely printed to the Default Printer for that computer. However, it is possible to set specific printing roles to other printers that might also be installed. For example, you may have a laser printer that should be used to always print scoresheets, or you may have a custom receipt printer that also includes a Cash Drawer. It will be necessary to perform the following steps on every computer connected on the network.

From the main menu, click on ***File*** then ***Printer Setup***. The following screen is displayed. Click on the Tab for the desired function, such as the cash drawer and select the correct device from the drop down list. (In the case of a Cash Drawer, it is often connected to a receipt printer). Then select the correct model to specify the command set that the device responds to.



Note: The settings in this printer setup screen are concerned with this computer only. Other computer workstations on the network will also need their own printer setup settings done.

If you do not have the optional Point of Sale module installed, you will probably not have a Receipt Printer, Cash Drawer or Customer Display installed. If this is the case, select ***Not Installed*** from the printer name drop down list.

If a particular POS Module is not installed, for example Bar, then the Tab relating to that module will be hidden to make the screen easier to read.

A summary table of the meaning of the various printer models is as follows:

Open & League Scoresheet.

Model	Description
0 Draft / Generic	This setting will print the scoresheets by printing directly to the printer port, without any formatting. This is used mainly for older Dot Matrix printers.
1 Standard Windows	The Standard Windows setting is the one that is most commonly used by all Laser printers and is the recommended setting. It uses the Windows printer driver and print spooler to handle all aspects of the print job.
13 LX300+	The remaining settings use the Draft / Generic method of printing directly to the printer port, the difference being the number of lines left before the first scores are printed. These are designed to be used with pre-printed, continuous paper scoresheets. The different number of lines suits the various models of Epson Dot Matrix printers described.
14 LX300	
15 LX100	
16 LX850	

Receipt Printer.

Model	Description
Draft / Generic	This setting will print the receipts by printing directly to the printer port, without any formatting. This is used mainly for older Dot Matrix receipt printers.
Standard Windows	This setting uses the Windows printer driver and print spooler to handle all aspects of the print job. If this option is used, you are able to create your own header and footer graphic which will appear when the receipt is printed. These files need to be stored as: P:\PROGRAMS\REPORTS\RECEIPT\RECEIPT HEADER.JPG and P:\PROGRAMS\REPORTS\RECEIPT\RECEIPT FOOTER.JPG See the online help manual for more information.
Epson B&W Printer	This setting is used of older Epson Dot Matrix receipt printers. It includes paper cut, but not commands for red text from a dual color ribbon.
Epson Color Printer	This setting is used of older Epson Dot Matrix receipt printers. It includes paper cut, as well as commands for red text from a dual color ribbon.
Star POS Printer	By selecting this option, the software will use the command set used for the Star Receipt printer emulation. Some older Dot Matrix receipt printers support this command set.
Citizen IDP 3210	This citizen Thermal Printer does not quite support the ESC POS command set. It uses a custom command to cut the paper and pop the cash drawer. Select this option only if you have this printer.
Citizen IDP 3530	These settings use the various Citizen command sets used by the different Citizen brand Dot Matrix receipt printers. As you can probably tell, in the past, receipt printers suffered from a lack of coordination of command sets amongst the various manufacturers.
Citizen IDP 3541	
Citizen IDP 3551	
ESC POS	ESC POS (Pronounced Escape POS) is a unified command set that most manufacturers support in their current range of printers, especially thermal receipt printers. It is highly recommended to use a thermal printer that supports ESC POS emulation and the ESC POS setting is the most commonly used setting.

Cash Drawer.

Model	Description
Serial Cash Drawer	It is possible to buy stand alone Cash Drawers that do not require a connection to a receipt printer in order to function. Most are serial, but parallel interface versions also exist. Use this setting if you have this type of cash drawer. You will have to create a printer in the windows printer list to represent the Cash 'UDZHU EXW LI WKLV LV GRQH WKH VRIWZDUH selected printer port which will then make a stand alone Cash Drawer open.
1st Cash Drawer	Use these settings to use the open command for Drawer #1 or Drawer #2 when connected to Citizen Dot Matrix receipt printers. (Most receipt printers support the connection of up to 2 different cash drawers at one time.)
2nd Cash Drawer	
1st Cash Drawer (ESC POS)	Use these settings to use the open command for Drawer #1 or Drawer #2 when connected to ESC POS compliant receipt printers. (Most receipt printers support the connection of up to 2 different cash drawers at one time.)
2nd Cash Drawer (ESC POS)	

Customer Display.

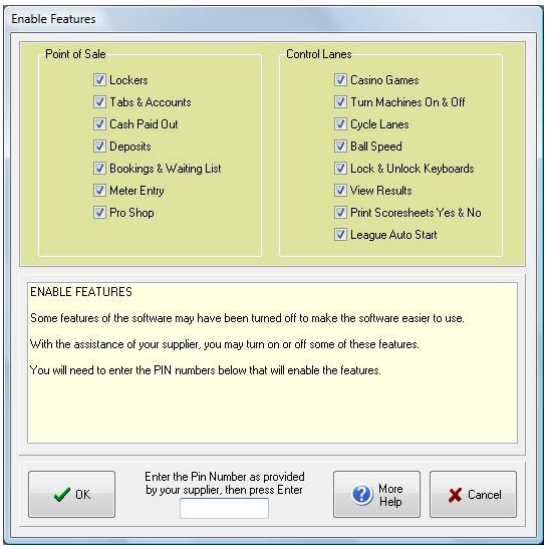
Model	Description
Standard Customer Display	This setting will support the display commands for a Citizen brand serial pass through Vacuum Fluorescent display. In the windows printer list, create a Generic/Text Only printer with the correct COM port. Then select this printer from the drop down list in the Computer Score printer setup screen.
POSIFLEX USB Display	The POSIFLEX range (and possibly other brands) of USB customer display are supported. There is no driver to install and the unit should just Plug N Play if this option is selected.

6. Enabling or Disabling Software Modules

It is possible to add or remove menu options if a section of the software is not going to be used.

Click on the ***System Management*** menu and click on the ***Register Software*** button. Click on the ***Enable Features*** button to show a screen with a number of check boxes for individual software features that can be enabled or disabled. By default all extra software features are disabled so that you can learn to use the essential aspects of the software, without being confused by additional buttons by software features that you may not use.

Each check box is password protected to stop staff members from enabling modules unnecessarily. Contact your sales representative for the number to enable any of these options.


Enable Features
Point of Sale
Lockers
Tabs & Accounts
Cash Paid Out
Deposits
Bookings & Waiting List
Meter Entry
Pro Shop
Control Lanes
Casino Games
Turn Machines On & Off
Cycle Lanes
Ball Speed
Lock & Unlock Keyboards
View Results
Print Scoresheets Yes & No
League Auto Start
ENABLE FEATURES
Some features of the software may have been turned off to make the software easier to use.
With the assistance of your supplier, you may turn on or off some of these features.
You will need to enter the PIN numbers below that will enable the features.
OK
Enter the Pin Number as provided by your supplier, then press Enter
More Help
Cancel

7. Install the Software on all other computers

All other computers, aside from the MASTER computer should be installed with the ***Workstation Installation*** button. This will install the minimum amount of software on each computer so that it can network to the COMSCORE NAS Disk to retrieve data.

&KDSWHU 6HWXS &HQWHU &RPPDQG WR VXL

Once you have successfully installed, updated and tested Center Command on all your computers, then you should think about what can be done to make Center Command operate the way you would like it. For more information on the day to day operation of the system, refer to the Operations Manual. The following section is intended to act as a setup guide for the center in general.

Note: Center Command was designed around a touch screen interface. Therefore, on most screens where you can change settings, there is an ***Edit*** button. Before pressing this button, all the fields on the screen are locked so that touching the screen cannot accidentally change them. To make a change to a setting, click on the ***Edit*** button, the screen will then turn blue, indicating that changes can now be made.

Control Setup

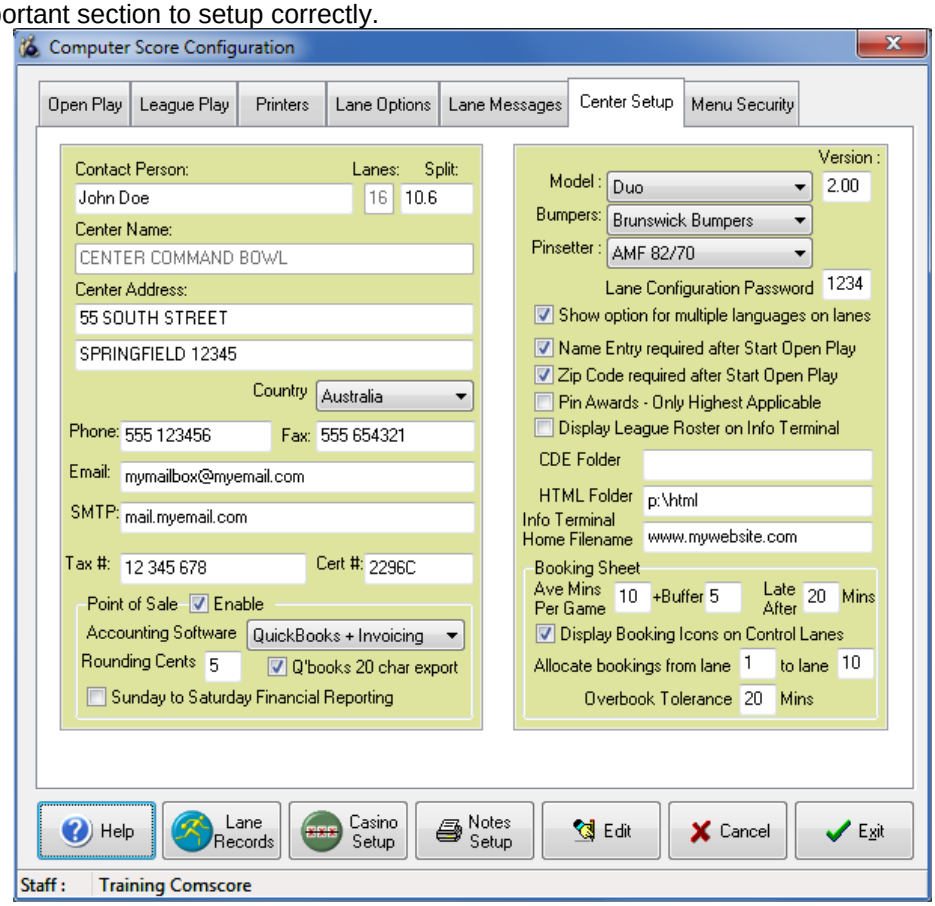
When registering the software, you have already entered the Name and contact details of your center. However, now you may wish to further customise the general software setup to suit your operations.

The main area for General System setup is from the Control Setup screen. Click on the ***System Management*** menu and select ***F2 Control Setup***.

Note: For more information on the Center Setup options, see the Computer Score Online Help System.

Center Setup Tab

Once in the System Setup program, click on the ***Center Setup*** Tab. This is the general setup area and is probably the most important section to setup correctly.



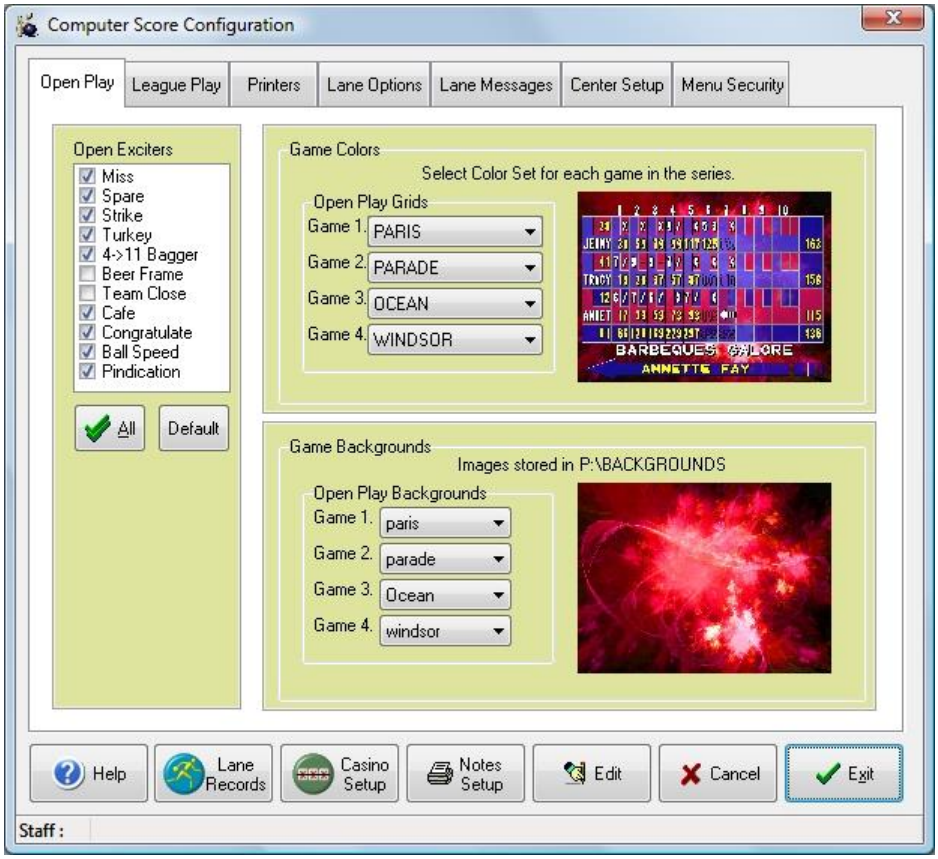
Aside from your Contact and Address details, make sure that the following fields are set correctly:

Field	Default Setting	Comment
Split	0	This is the maximum number of lanes on each row in the Control Lanes screen. There can be up to three rows of lanes. Leave Blank or 0 for Auto Split. Alternatively, enter 1, 2 or 3 digits separated by a comma for the number of lanes per row. For Example: (Assuming 16 Lanes total, as above): 6,10 will result in two rows of icons, the first with 6 lanes and the second with 10. 4,10,6 will result in three rows of icons, the first with 4 lanes, the second with 10 lanes and the third with 6 lanes.
Country	USA	This sets things such as the date format and Sales Tax vs GST
Model	Duo	Choose the type of lane hardware in your center
Bumpers	Not Available	Choose Brunswick bumpers for Centrally controlled Pinball Wizard Auto Bumpers, Choose AMF Bumpers for all others.
Pinsetter	AMF 82/70	Select the Pinsetter type for your center from the list.
Lane Configuration Password	1234	You should choose a 4 digit password for your center. This password is used to gain entry to the Configuration Wizard on the Lanes, when they are on-line.
Show option for Multiple languages on lanes	Unchecked	Place a tick here to show an extra option in the Messages Tab of the Control Lanes screen. This option allows you to set the language of the lanes for the current group bowling. The default language is set from the Setup Wizard in Chapter 8 above.
Name Entry required after Start Open Play	Checked	When a Social lane is started, automatically shows the Name Entry screen for the operator to pre- H Q W H U E R Z O H U ¶ V
Zip Code required after Open Play	Unchecked	Allows the polling of your Social Bowlers to find out what Zip Codes are visiting the center. Can be turned on or off at any time.
Pin Awards ±Only Highest Applicable	Unchecked	If checked, the system will only give out the highest Pin Award that a bowler achieves. Lower award levels are ignored until another, lower score is bowled.
Display League Roster on Info Terminal	Unchecked	, I F K H F N H G W K H % R Z O H U ¶ V , Q I R 7 H U P L Lane Draw Roster for the next league.
CDE Folder	Blank	Type the location where data should be saved when exporting to CDE League Secretary (Optional)
HTML Folder	P:\HTML	This is where any league Standing Sheets are saved before uploading to your Website.
Info Terminal Home Filename	Blank	Enter the location of a HTML file to use as a local website to welcome patrons, highlight the facilities and advertise your center. This will be the default page shown on the Bowlers Info Terminal. (If the Display League Roster on Info Terminal option is Checked)
Average Mins per Game	10	This is the assumed rate of play as used by the Booking Sheet to estimate the finishing time for bookings. (The finishing time for lanes in use is calculated from their actual rate of play.)
Buffer Time	5	The average time that a booking group will take to get to the lanes, put on shoes, etc and start playing.
Late After Minutes	20	If a booking is more than 20 minutes late, then they will be removed off the Booking Sheet and Waiting list and placed on a separate Late Bookings list. They can be reinserted (at the next available time slot) by either confirming the booking or performing a Check In on the group.
Display Booking Icons on Control Lanes	Checked	Shows an icon on each lane when there is a League or Booking due to start soon.
Allocate bookings from Lane to Lane	0 to 0	Some centers have corporate lanes with bar facilities and so do not want regular bookings to use those lanes (Saving them for corporate groups or parties.) In the above screen, bookings will be allocated from lanes 1 to 10. You can still manually assign any lane you want. To disable this feature and allow the entire lane to be used for bookings enter either 0 to 0, the entire house (1 to 16 in the example above) or leave the fields blank.
Overbook Tolerance	20	This will allow the booking sheet make a booking in a position where there would not normally be room, IF the booking will only

		delay others by less then 20 minutes. This allows you to over-book the center by an amount, in the knowledge that a percentage of bookings will not arrive at all.
Email	blank	Enter the email address for the business. This will be the one used when emailing report from the system.
SMTP	blank	(Simple Mail Transfer Protocol) This setting is provided by your Internet Service Provider and is your outgoing mail server address. Fill this in to enable the emailing of reports and score sheets directly from the system.
Tax #	blank	7 K L V L V \ R X U F R X Q W U \ ¶ V W D [, ' Q X P E H U printed on all your customer receipts. For Australian centres, this is your ABN.
Cert #	blank	This is your lane certification number.
Enable Point of Sale	Checked	Use this option to temporarily disable Point Of Sale, even when the POS module is registered. This is useful if you wish to start using the system straight away, before setting up Point of Sale Items and accounts.
Rounding Cents	0	This field is used if your country has a smallest coin that is not 1 F H Q W) R U H [D P S O H 1 H Z = H D O D Qt ¶ V V Therefore all prices must be rounded to the nearest 10 cent value. In this situation, enter 10 in this field. Leave blank or 0 for no rounding.
Sunday to Saturday Financial Reporting	Unchecked	Tick this field to have the weekly reporting period to be from the Sunday to the Saturday of any week. Leave the field unchecked for the reporting period to be from Monday to Sunday.
Accounting Software	Quickbooks	This option displays or hides the Menu button to produce a Quickbooks export .iif file. If you do not use Quickbooks, select Not Installed and the button will not appear in the Point of Sale Menu. Select Quickbooks + Invoicing to separate account transactions as Invoices and Payments in Quickbooks. If you do not use Quickbooks, then select Not Installed.
4 ¶ % R R N V F K D U H	Checked	Older versions of Quickbooks were limited to 13 characters for POS Item descriptions in their import facility. Select 20 characters if you have a current version of Quickbooks.

Open Play Tab

The Open Play tab is used to define the graphics modules and the score grid color schemes to use when the lanes are in Open Play Mode.



Open Exciters

Select which categories of exciter graphic you would like to be played to your Open Play bowlers. By default Beer Frame (All bowlers except one close their frame) and Team Close (All bowlers bowl a closed frame) are not selected because they are not very relevant to Open Play.

Game Colors

Select the desired score grid colors for the first four games in the series. Each time you select a different grid color, an image for the score grid is shown to allow you to get an idea of the score grid color. This pattern of colors is repeated from game five onwards.

Game Backgrounds

In a similar manner to the Game Colors, select the desired background image for the first four games in the series. The combination of the Game Color and the Game Background will determine what the score grid will actually look like.

You are also able to make your own score grid background images by creating a 640 x 480 PCX image as defined below, and saving it into the P:\backgrounds directory. Once this is done, the image will be included in the drop down list.

Graphic Name: any name up to 20 characters
Description: Score grid background image
Graphic Type: PC Paintbrush (PCX)
File Location: p:\backgrounds
Dimensions: 640 pixels (W) x 480 pixels (H)
Color Depth: 24 bit (RGB True Color)

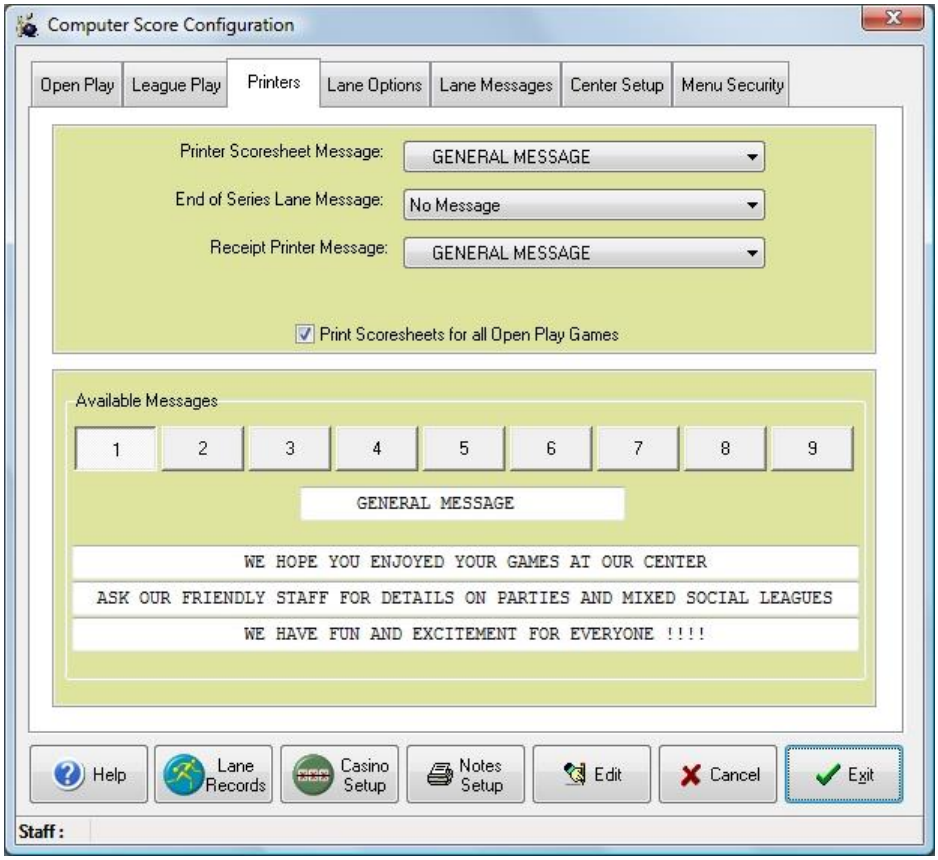
League Play Tab

The League Play tab has the same items as the Open Play Tab, the only difference is that these controls will determine how a League Play score grid will look. Select the desired exciter graphics categories, as well as the score grid colors and background images for the fist four games in the series. After the first four games, these color combinations will be repeated.

Printers Tab

The printers tab allows you to define up to nine customised messages for different situations.

To make a customised message, click on one of the 9 different buttons in the Available Messages section and enter your message on the three message lines provided. Also type a short description in the description field above.



To use a message for any of the three situations, simply select the desired message from the relevant drop down list.

Note: When creating a message for the Receipt Printer, please bear in mind the most receipt printers are only capable of printing text of 40 characters wide across the page, rather than the usual 80 characters. If this is the case with your receipt printer, then only use a maximum of 40 characters in each message line.

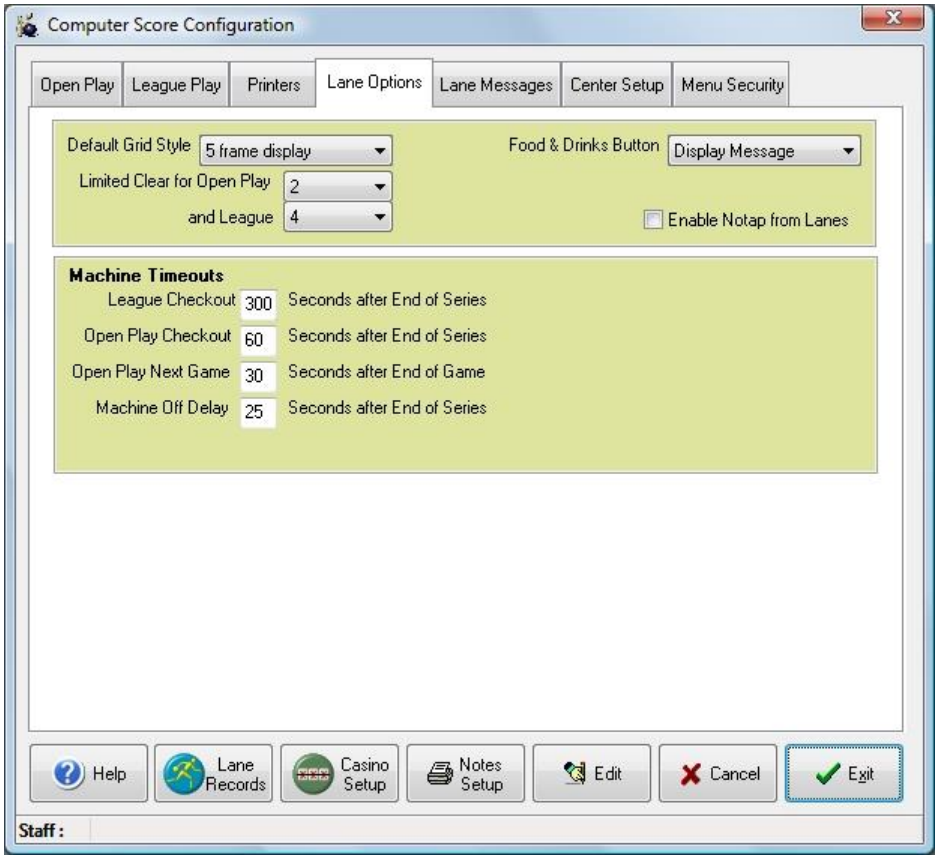
Print Scoresheets for all Open Play Games

This check box determines whether a scoresheet will be printed every time a social group finishes their bowling. If you remove this check box, no scoresheets will be printed unless the operator specifically requests one from the Start Tab of the Control Lanes screen. It is a common desire to save money by turning off Open Play scoresheets, but this is not recommended from a pure customer relations point of view. The scoresheet is often the only thing that your bowlers will take away from the lanes, and it is a good opportunity to try to encourage them to visit your center again, by printing a discount offer at the bottom of the scoresheet. For more information, see Creating pictures to customise the system, below.

Scoresheets for League play are turned on or off on a league by league basis from the Auto Scoring Tab of the League Setup screen. By default scoresheets are turned off for a new league.

Lane Options Tab

7KH /DQH 2SWLRQV WDE GHWHUPLQHV WKH WLPLQJ RI WKH SLQVHWWH for the operation of the scoregrids.



Default Grid Style

The scoregrids are able to display either the entire 10 frames in the game of a larger 5 frame version which scrolls across as the game progresses. Alternatively and is also the default Automatic Mode which shows the 5 frame mode for the initial part of the game, and then expands out to the 10 frame mode once the fifth frame is reached. Choose the desired display type from the drop down list.

The desired default Scoregrid size can also be set on a League by League basis from the Auto Scoring tab of the League Setup screen.

Limited Clear for Open Play

7KLV ILHOG ZLOO VHW D OLPLWHG QXPEHU RI WLPHV WKDW D VFRUH F For example, setting a value of 5 will mean that the clear button can only be pressed 5 times before a message appears saying that for further score corrections, please see the counter staff. This stops Open Play bowlers from over bowling by clearing out large portions of the game.

Limited Clear for League Play

This field behaves exactly the same as the Limited Clear for Open Play, only for Leagues. It is common to set a slightly larger number of clears for league players, but this is totally optional.

Food & Drinks Button

7KLV GHWHUPLQHV WKH EHKDYLRXU RI WKH ODQHV ZKHQ WKH)RRG '

- If the ***Display Message*** option is selected, then when the Food & Drinks button is pressed, a full screen message advertising the Café will be displayed for about 15 seconds.

- If the ***Waitress Call*** option is selected, then when the button is pressed, the background of the scoregrid is changed to the image of a hamburger and an animated message is shown saying that a Waitress has been called. In addition to this a message is displayed on the Café Point of Sale screen (If software module is installed) telling the operator that the lane requires assistance. Press the Food & Drinks button again to cancel the Waitress Call for this lane.

Enable No-Tap from Lanes

This option will enable or disable the ability to select a No- 7 D S J D P H G L U H F W O \ I U R P W K H % R Z O lanes. This is done by pressing ***Help*** then ***7 Scoring Options***, then ***C Competition Play***, then selecting the desired No Tap option.

No-Tap from the Lanes is usually disabled by default.

Even if this option is disabled here, it is still possible to set a lane into No Tap by clicking on the ***Play Mode*** tab in the Control Lanes screen and selecting the desired No-Tap game.

Machine Timeouts

This series of fields determines the behaviour of the scorer at the end of each game or at the end of the entire series, the default values are set as follows:

Field	Default Setting	Comment
League Checkout	240 seconds	In League Play mode, this is the amount of time in seconds before the scoregrids are removed automatically, once the series has been completed. This gives the league bowlers time to fill in their recap sheets.
Open Play Checkout	120 seconds	In Open Play mode, this is the amount of time seconds before the scoregrids are removed automatically, once all games have been bowled.
Open Play Next Game	60 seconds	In Open Play mode, this is the amount of time, before the Scoregrid advances to the next game in the series automatically, once a game has been completed. **Note:** If a ball is bowled during this period, the Scoregrid will advance to the next game straight away.
Machine Off Delay	15 seconds	Once the last ball is bowled, the scorer will automatically turn off the pinsetter after this period of time, so those bowlers cannot over-bowl.

Lane Messages Tab

The Duo model allows you to create a series of images for display on any vacant lanes as a slide show.

Select one of a number of pre-created images from the drop down lists. Then define how long each message will display, by entering a number of seconds in the field provided. Also place a tick in the enabled field for each message to be used in the slide show.

Creating your own messages

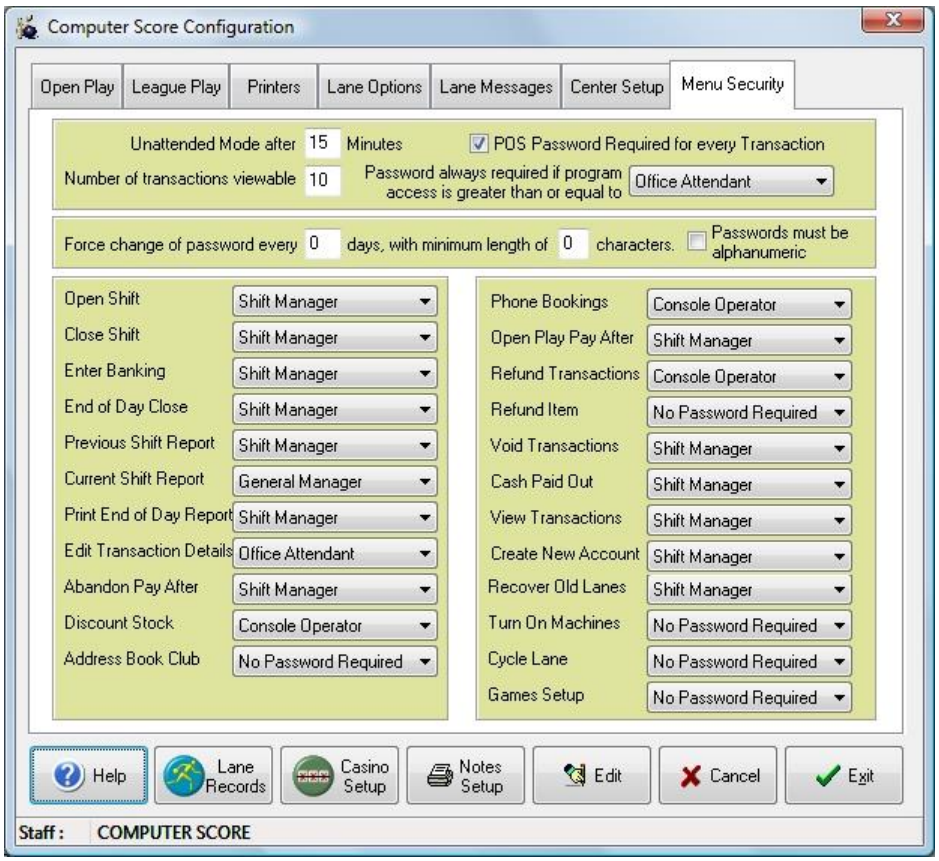
Each message is an image that you can create using any third party graphics program. The specifications for these images are shown below. If you are unable to create these images, consult a local printer who will be able to produce them for you. Once you have created the message image, save it into the P:\MESSAGES directory and the image will appear in the drop down list, along with the other messages already in the system.

Graphic Name: any name up to 20 characters
Description: Lane Monitor Message used when lanes are not in use
Graphic Type: PC Paintbrush (PCX)
File Location: p:\messages
Dimensions: 640 pixels (W) x 480 pixels (H)
Color Depth: 24 bit (RGB True Color)

Menu Security Tab

The Menu Security Tab only becomes visible if the Employee security system has been turned on. See: The next topic for more information on how to do this.

In addition to this, if the Point of Sale module is not installed, all items relating to POS functions will be hidden from this screen, so the screen you see may differ from the one shown here.


Computer Score Configuration
Open Play
League Play
Printers
Lane Options
Lane Messages
Center Setup
Menu Security
Unattended Mode after 15 Minutes
POS Password Required for every Transaction
Number of transactions viewable 10
Password always required if program access is greater than or equal to Office Attendant
Force change of password every 0 days, with minimum length of 0 characters.
Passwords must be alphanumeric
Open Shift Shift Manager
Close Shift Shift Manager
Enter Banking Shift Manager
End of Day Close Shift Manager
Previous Shift Report Shift Manager
Current Shift Report General Manager
Print End of Day Report Shift Manager
Edit Transaction Details Office Attendant
Abandon Pay After Shift Manager
Discount Stock Console Operator
Address Book Club No Password Required
Phone Bookings Console Operator
Open Play Pay After Shift Manager
Refund Transactions Console Operator
Refund Item No Password Required
Void Transactions Shift Manager
Cash Paid Out Shift Manager
View Transactions Shift Manager
Create New Account Shift Manager
Recover Old Lanes Shift Manager
Turn On Machines No Password Required
Cycle Lane No Password Required
Games Setup No Password Required
Help
Lane Records
Casino Setup
Notes Setup
Edit
Cancel
Exit
Staff : COMPUTER SCORE

Select the desired employee level for each of the actions listed. It is advisable to start off with the default values and then modify them only when you are familiar with the system.

Specific Actions that need an explanation include:

Field	Default Setting	Comment
Unattended Mode after XX Minutes	15 Minutes	After a period of inactivity, the system will log out whoever is currently logged in and then present the password entry screen. A valid password must be entered before any further work can be done. This is so that if the control desk is left unattended, unauthorised persons can not use the system. This is the same process as pressing the Unattended button.
Number of Transactions viewable	10	When viewing a list of transactions rung up for a day, it is unwise to view every single transaction. Otherwise a staff member would be able to count the transaction totals to work out the current balance in the cash drawer. This field allows you to limit the list of transactions to only the last (say 10) rung up.
POS Password Required for Every Transaction	False	This option will force a password to be re-entered every time a Point Of Sale transaction is done. This is so you can accurately track which staff member does each transaction. It is not recommended to use this option unless it is actually needed, otherwise staff will soon tire of entering their password constantly.
Password always required if program access is greater than or equal to	Office Attendant	If a program requires (Say) an Office Attendant level employee, then the system will require an Office Attendant level or higher password to be entered, even if a high level employee is already logged in. This system enables users to log in once and perform low level work without having to re-enter their password all the time. However, if a high level program is required, then a password must be entered, regardless of the level of the employee currently logged in.

Field	Default Setting	Comment
Force change of password every X days	0 or Blank	7 K L V R S W L R Q D O I L H O G D O O R Z V \ R X W R password must be changes after the specified number of days since the last time that it was changed. This help reduce the common situation that staff passwords often become well known over time. To disable this feature, enter 0 days or leave the field blank.
With minimum length of X characters.	0 or Blank	This optional field will mandate that all staff passwords (Whether they will expire after a specified number of days or not) must be at least the entered number of characters long. A common value for this field is which will force all passwords to be at least 4 characters long.
Password must be Alphanumeric.	False	This optional field will mandate that all passwords must contain both letters and numbers. This is done in order to stop staff from using easily guessed passwords.

Enable Password Security

By default, there are no employees entered into the system when it is first installed. Often, in an owner/operator situation, it is desirable that there be no security passwords at all. This is because where the people than own the center, run the center, typing password would only get in the way.

However, for virtually all other Bowling Centers, security is definitely required.

To enable the security system, click on the ***Employee Details*** button in the ***System Management*** menu. Click on the ***Add*** button to create a new employee. A warning screen will pop up telling you that once the security system L V D F W L Y D W H G L W F D Q ¶ W E H W X U Q H G R I I & O L F N R Q W K H 2 . E X W W R Q W H a General Manager security level. This is because a General Manager is required to enter the Employee Details screen.

Fill in all the contact details and enter a password for the General Manager. Select General Manager from the List of Access Levels.

The description of these Access Levels is as follows:

Access Level	Comment
No Access	This is the lowest level that should be used when an Employee has left the company and should no longer be able to use the computer. The name should E H N H S W L V F D V H \ R X Z L V K W R O R R N W K U R X J K I history. You should als R F K D Q J H W K H H P S O R \ H H ¶ V S D V V Z
Console Operator	Console Operator is designed to be junior staff members who are permitted to perform basic functions, but who are not trusted to perform end of shift and end of day functions.
Shift Manager	Shift Managers are those main staff who are responsible for the correct counting of the Cash Drawers on a daily basis, but who are not responsible for viewing any Point of Sale figures or performing any Point of Sale setup operations.
Office Attendant	Office Attendants are responsible for the general smooth running of the business including performing any adjustments to the POS figures and creating POS Items and Macros.
General Manager	A General Manager is able to perform all other tasks including Adding Employee passwords, updating the software and Closing Databases.
System Administrator	There should be no need to create any System Administrator level employees. This is only used by Computer Score support staff.

The default Access Level for each main menu item is as follows: Any items missing are controlled separately from the Menu Security screen.

Menu	Item	Default Access Level
Control Lanes	Audit Report	Shift Manager
League Secretary	League Setup	Shift Manager
League Secretary	Team Details	No Security Required
League Secretary	League Bowlers	No Security Required
League Secretary	League Schedule	Shift Manager
League Secretary	Edit Game Scores	Shift Manager
League Secretary	List Leagues Print	No Security Required
League Secretary	Bowlers Record Print	No Security Required
League Secretary	Team Record Print	No Security Required
League Secretary	League Record Print	No Security Required
League Secretary	Standing Sheet Print	No Security Required
League Secretary	League Bowlers Print	No Security Required
League Secretary	Recap Sheets Print	No Security Required
League Secretary	League Schedule Print	No Security Required
Address Book & Brackets	Edit Address Book	No Security Required
Address Book & Brackets	Add / Edit Mailing File	No Security Required
Address Book & Brackets	Brackets & Sweepers	No Security Required
Address Book & Brackets	Address Book Print	No Security Required
Address Book & Brackets	Mailing File Print	No Security Required
Address Book & Brackets	Absent Bowlers Print	No Security Required
Address Book & Brackets	Bowler Notes Print	No Security Required
Address Book & Brackets	Print Brackets	No Security Required
Point Of Sale	POS Item Setup	Office Attendant
Point Of Sale	Display POS Transactions	Office Attendant
Point Of Sale	Edit Daily Totals	Office Attendant
Point Of Sale	Quickbooks Export	Office Attendant
Point Of Sale	Database Close	General Manager
Point Of Sale	Locker Rental	Office Attendant
Point Of Sale	Add / Edit Deposit	Office Attendant
Point Of Sale	Edit Pro Shop Stock	Office Attendant
Point Of Sale	Financial Reports Print	Office Attendant
Point Of Sale	Transaction Report Print	Office Attendant
Point Of Sale	List Lockers Report Print	Shift Manager
Point Of Sale	Deposit List Print	Shift Manager
Point Of Sale	Pro Shop Stock Print	Shift Manager
Point Of Sale	Macro Report Print	Office Attendant
Café & Bar	POS Item Setup	Office Attendant
Café & Bar	Display POS Transactions	Office Attendant
Café & Bar	Edit Daily Totals	Office Attendant
Café & Bar	Database Close	General Manager
Café & Bar	Quickbooks Export	Office Attendant
Café & Bar	Financial Reports Print	Office Attendant
Café & Bar	Transaction Report Print	Office Attendant
Café & Bar	Macro Report Print	Office Attendant
System Management	Employee Details	General Manager
System Management	Control Setup	Office Attendant
System Management	Awards Setup	Shift Manager
System Management	Update System	General Manager
System Management	Staff Menu Log Print	General Manager
System Management	League Statistics	Console Operator
System Management	Zip Code Analysis	No Security Required
System Management	Congress Awards	No Security Required

Enable Tabs and Accounts

Center Command allows you to ring up transaction (Most commonly for regular School and Corporate Groups) and place them on an account, instead of paying Cash. This account can then be paid off on another day. For more information on Tabs and Accounts, see either the Online Help system or the Operations manual.

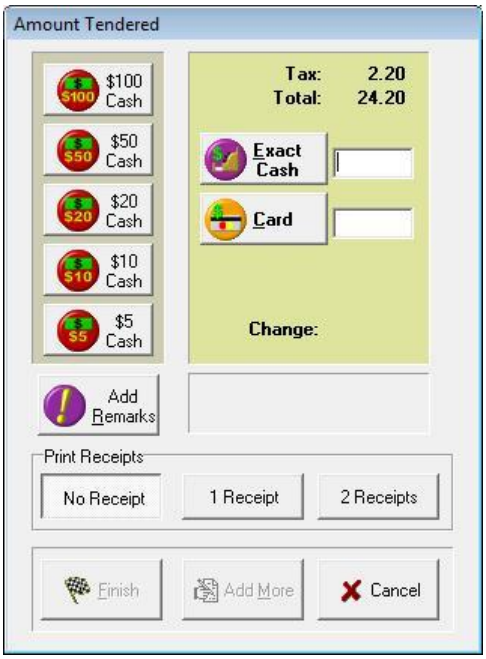
By default, the Tabs and Accounts system is disabled. To turn it on, first you must enable this section of the software from the ***Enable Features*** button in the ***Register Software*** screen in the ***System Management*** menu.

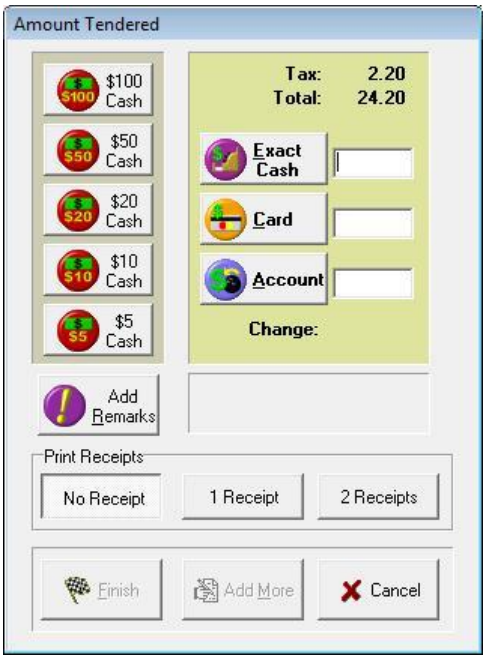
See your Computer Score representative for the code to turn this feature on.

Creating Accounts

It is a good idea to create accounts for some of your customers who you know will want this feature. To do this, follow these steps: (It is assumed at this point that a Point Of Sale Shift has been opened and you are trading normally)

1. From the Control Lanes Screen, select the ***F6 POS*** tab and click on the ***Pay Account*** Button. This button will be hidden unless the Tabs and Accounts Feature is turned on from the Enable Features screen.
2. Click on the ***New Account*** button. Select ***New Account***. For more information on the difference between a Tab and an Account, see the Online Help system.
3. Enter all the Accounts details including Address and Phone number.
4. Enter a unique Account Code to identify this account.
5. Click ***OK*** and finish adding the Account.
6. Click on the ***Close*** button to back out without making an Account Payment.





Once this has been done, an ***Account*** button will appear on the Amount Tendered screen at the end of every transaction. Click on this button to select which account to assign to the transaction. For more information on Transactions on account, see the Online Help system.

Warning: Resist the temptation to add a Tab or Account for anyone who asks for one. This usually results in an enormous list of Tabs or Accounts, which could eventually prove to become unworkable and confusing. Consider creating a series of tabs or accounts that you could reuse by changing the details, rather than creating a new one for each customer. Eg Table numbers, or Lane numbers, or use colored wristbands for Birthday parties.

Create some POS Items

Although Center Command comes installed with a basic set of pre-installed Point of Sale items and Macros, you will want to customise these to suit your own situation. See the Operations Manual or the Online Help system for more information on creating your own POS Items and Macros.

Pay particular attention to the function of the various Unit Type and Report Types available for each POS Item. Some functions require the existence of particular POS Items in order to function.

Creating pictures to customise the system.

There are a number of images that can be created in order to customise the software to your center. Most of these images must be a specific size and format and must also saved as a specific file name in a specific location. The following images are not required if the Duo Units are not connected to the optional system management computers.

Scoresheets

If no images exist for the scoresheets, then the system will automatically use a set of default images with a standard Logo.

Otherwise, create the following images as below:

Graphic Name: header.bmp
Description: Scoresheet Heading
Graphic Type: Windows Bitmap (BMP)
File Location: p:\programs\reports\scoresheet
Dimensions: 674 pixels (W) x 144 pixels (H)
Color Depth: 24 bit (RGB True Color)

Graphic Name: footer.bmp
Description: Scoresheet Footer
Graphic Type: Windows Bitmap (BMP)
File Location: p:\programs\reports\scoresheet
Dimensions: 674 pixels (W) x 144 pixels (H)
Color Depth: 24 bit (RGB True Color)

Internet League List

The Internet League List is a special report in the List Leagues screen which lists only those leagues for which HTML standing sheets are required for a Bowlers Info Terminal or FTP upload to a web site. A graphic is required to place your logo on the top of this report. This image is only used if the optional League Secretary software module is installed.

Graphic Name: logo.gif
Description: Company Logo on the top of Bowlers Info Terminal List of Leagues
Graphic Type: Compu Serve (GIF)
File Location: p:\html\pictures (You may need to create this directory)
Dimensions: unlimited, but usually 674 pixels (W) x 144 pixels (H)
Color Depth: 8 Bit (256 Colors, optimised palette)

Invoices

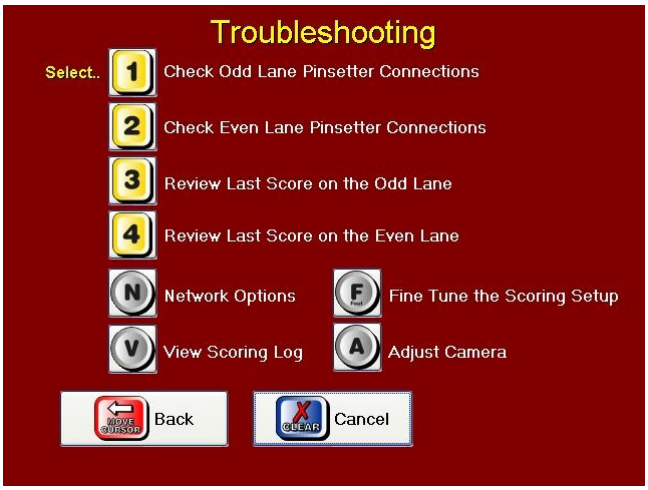
The system will give you the option to print a plain paper invoice for any account transaction. Two graphics are required to place your logo and remittance details on the top and bottom of this invoice. The following images are only required if the optional Point of Sale software module is installed and the Tabs / Accounts feature is enabled.

Graphic Name: invoiceheader.gif
Description: Logo on top of Letter size Invoice for account transactions
Graphic Type: Compu Serve (GIF)
File Location: p:\programs\reports\invoice
Dimensions: 674 pixels (W) x 144 pixels (H)
Color Depth: 8 Bit (256 Colors, optimised palette)

Graphic Name: invoicefooter.gif
Description: Remittance advice on bottom of Letter size Invoice for account transactions
Graphic Type: Compu Serve (GIF)
File Location: p:\programs\reports\invoice
Dimensions: 674 pixels (W) x 144 pixels (H)
Color Depth: 8 Bit (256 Colors, optimised palette)

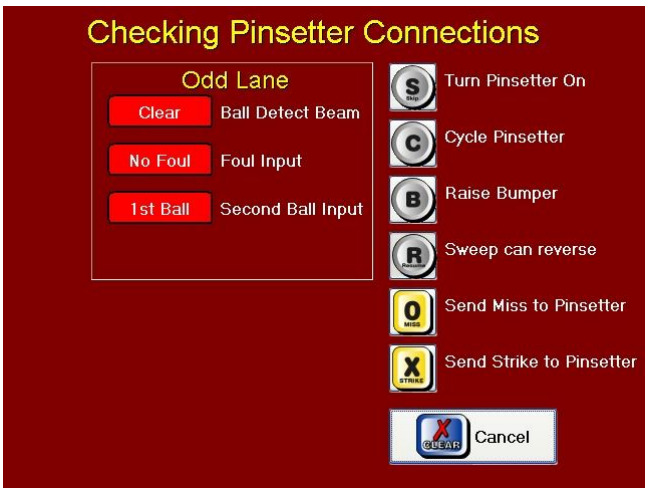
$SSHQG-LBV$LQJ WKH 7URXEOHVKRRWLQJ 6FUHH

Because the Setup Wizard is designed to be a simple step by step process to enable the Duo module to start scoring quickly, there are several advanced features and diagnostic tools that are contained in the Troubleshooting screens. These tools will allow \RX WR VHW DQG UHYLHZ DOO DVSHFWV RI WKH 'XR KDU

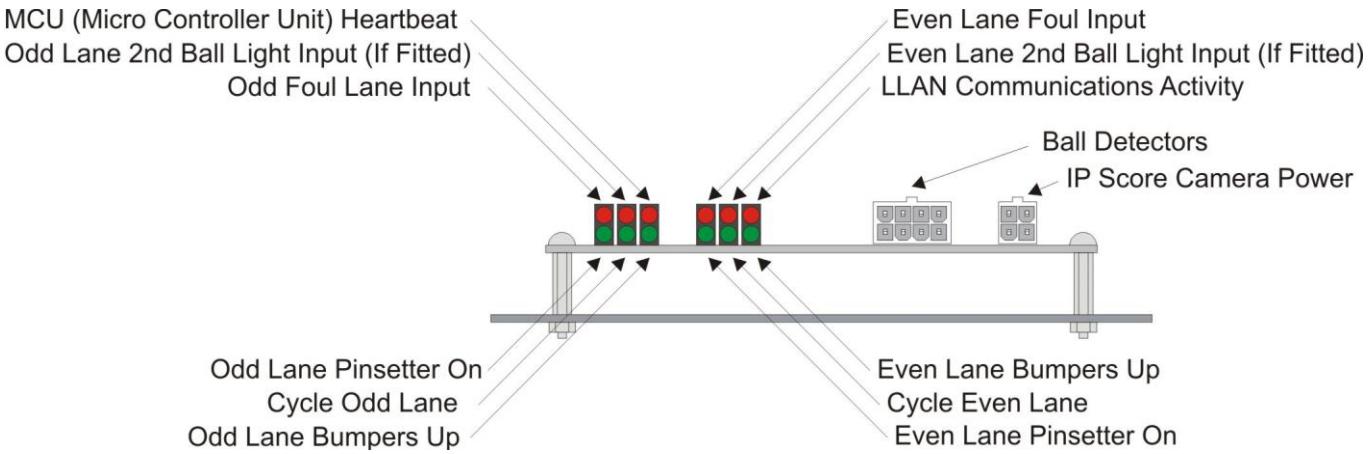


Checking the Machine Connections

Options ***1*** and ***2*** of the Troubleshooting screen allow you to review and test the Pinsetter connection Inputs and Outputs that are used by the Duo Hardware Module to control the Pinsetter. Depending of the Pinsetter model, not all the options shown below will be available and this screen will change depending on the Pinsetter Model Type selected in the Setup Wizard.



When testing some of the Input or Output connections, a corresponding LED on the Duo Camera Module (If fitted) will also be lit to show that the command has been received.


MCU (Micro Controller Unit) Heartbeat
Odd Lane 2nd Ball Light Input (If Fitted)
Odd Foul Lane Input
Even Lane Foul Input
Even Lane 2nd Ball Light Input (If Fitted)
LLAN Communications Activity
Ball Detectors
IP Score Camera Power
Odd Lane Pinsetter On
Cycle Odd Lane
Odd Lane Bumpers Up
Even Lane Bumpers Up
Cycle Even Lane
Even Lane Pinsetter On

Outputs

Turn Pinsetter On / Off	This command will turn the Pinsetter on and off when pressing the ***S*** button on the keypad.
Cycle Pinsetter	This command tests the cycle connection to the Pinsetter. Press the ***C*** button to cycle the machine. The Pinsetter must first be on to test this.
Raise / Lower Bumpers	This command tests the connection to Automatic Bumpers that are directly connected to the Duo units. It does not test bumpers centrally controlled from the computers, such as Brunswick Ball Wall. Press ***B*** to raise the bumpers on this lane. Press ***B*** again to lower them.
Sweep can Reverse	This command is only available on certain Pinsetter Model types, such as the AMF 82_90 MP chassis. It specifies where the Pinsetter is able to accept a sweep reverse command from the Duo unit. Not all MP chassis or MK Extender 82_70 pinsetters have sweep motors wired to accept these commands. You are able to alter the behaviour of the Duo Unit to match the capabilities of your pinsetter.
Send Miss to Pinsetter	This command is only available on certain Pinsetter Model types, that are able to perform a short cycle on a first ball miss. If available, press ***0*** to make the Pinsetter perform a Miss cycle, without bowling a ball.
Send Strike to Pinsetter	This command is only available on certain Pinsetter Model types, which are able to perform a strike cycle on command from an external source. If available, press ***X*** to make the Pinsetter perform a Strike cycle, without bowling a ball.

Inputs

Ball Detect Beam	Every time the Ball Detector beam is cut, the indicator will go green to let you know that a ball has gone past. If this light is green all the time or flashing green, then you need to readjust the Ball Detector eyeball mount.
Foul Input	If your Foul Units are connected to the Duo unit (Optional) then this indicator will go green every time the Foul signal is received by the Duo unit.
Second Ball Input	Depending on your Pinsetter type, the second ball light may be connected to the Duo unit. (Most commonly done with 82-70MP chassis, 82-90 and 82-90XL) If this is the case then this indicator will go green every time the second ball light signal is received by the Duo unit. GS series Pinsetters will also use this second ball Input, but the signal is received directly from the Pinsetter via the communications port. Again, this indicator will go green whenever this signal is received.
Sweep Input	This is only available from the AMF 82-90XL and XLi pinspotters and is received by the Duo via the serial communications plug. When the sweep drops, this light should turn green. When the sweep is up, the light should be red.

Reviewing the Last Score Bowled

The options ***3*** and ***4*** of the Troubleshooting screen allow you to review the last ball that was scored on either the Odd or Even Lane. In this example, we will use the Even Lane on an AMF 82-70 equipped center.

Save the Last Score

At any time, you are able to save an animation of the score to an AVI file. This will allow you to e-mail an example of a recurring scoring problem to your sales representative so that the problem can be quickly diagnosed and corrected. Press the ***S*** button to save the ani P D W L R Q W R W K H ' X R ¶V Vcreen as a file named XX.avi where XX is the lane number of the score saved.

The overwhelming source of scoring problems occurs from the incorrect behaviour, timing or lighting of Pinsetting machines. However, it can be very difficult to diagnose these problems without seeing a replay frame by frame. The Review Last Score screens allow you to do this.

Press the ***Move Cursor Right*** and ***Move Cursor Left*** buttons to scroll forward and back through the four stages that are captured for every score.

Stage 1. Scoring Cycle Started

This first stage represents the image taken at the time when the Duo software first becomes aware of a change circumstance, which will result in a score being taken.

For most Pinsetters, this is when the Ball cuts the Ball Detector beam at the Duo Hardware Module. However for Pinsetters using the Pinsetter Communications Port (For example, AMF 82-90XL and GS series Pinsetters) this Stage is triggered via a signal from the Pinsetter itself.

Things to Check

If you are having scoring issues, check the following areas:

1. Make sure the correct Pinsetter type is displayed in the Software Flags area.
2. Check that the number of pins down reported in the Software Flags area, is correct compared to the number of green bars in the brightness section.
3. Check for any Hardware flags being reported directly for the Pinsetter (Depending on Machine Type), such as Second Ball light or Sweep Down.
4. Make sure that the Ball Speed report is approximately correct. An incorrect Ball Speed can affect the timing of W K H V F R U L Q J V R I W Z D U H E H F D X V H L W X V H V W K H E D O O ¶V V S H H G W R F R P ***Take Data Delay*** for 82-70 Pinsetters is 4.5 seconds, the Ball Speed Delay is calculated at 0.4 seconds, therefore the score will be taken in 4.9 seconds from this time.

Stage 2. Score Determined

The second stage represents the expiration of the ***Take Data Delay***. This delay can be set from the ***Fine Tune the Scoring Setup*** screen and is preset for each type of Pinsetter. You should never need to change this Take Data Delay, but if it is set too long you could see an image of the Table on first ball and if it is set too short, you could see an image of the pins still falling.

At this point the number of pins the Duo sees will be the score reported.

A pin is determined to be present whenever the level of brightness at the Pin Position Indicator is higher than the threshold level. The Pin brightness is indicated by the height of the bar in the bottom left of the screen and the two horizontal lines on each side of the brightness bars represent the threshold level.

This threshold level is calculated by the brightness of the pit area between the 6 & 10 pins on the Odd lanes and between the 7 & 4 pins on the Even lanes. This level will automatically change as general lighting conditions change. This means that the Duo scoring software is just as effective during disco and glow conditions as normal bowling. No adjustments are needed to be made when changing from one condition to the other.

In this example, the default ***Delay from Score Taken to Pins Set*** is 6.0 seconds. Therefore, the next stage (Event) will occur at that time.

Things to Check

If you are having scoring issues, check the following areas:

1. Make sure that the number of pins down equals the number of green bars in the Brightness section and is also F R U U H F W L Q W K H 3 O D \ H U ¶ V 6 F R U H V H F W L R Q
2. Make sure that there are no red bars that are close to going over the Pin Brightness threshold. (Thus a pin being considered present.) If any of these red bars are close to the threshold line, then there is a danger that variations in lighting conditions from ball to ball could cause a pin to be falsely detected. Check to see if things such as oil streaks down the curtain are causing the pit to look bright in the relevant area.
3. Check that the Pin Position Indicators are not being blocked by the Sweep / Rake. Usually, the Sweep / Rake should be in the guard position when the ***Take Data Delay*** expires and the score is determined. Make sure that rake is not blocking the pins and the deck/table should not be moving. This is particularly important with Brunswick A2 pinsetters, because the deck will block the pit light and make the pins (especially the head pin) appear dark, possibly dropping the light level below the threshold and causing the pin to be missed.

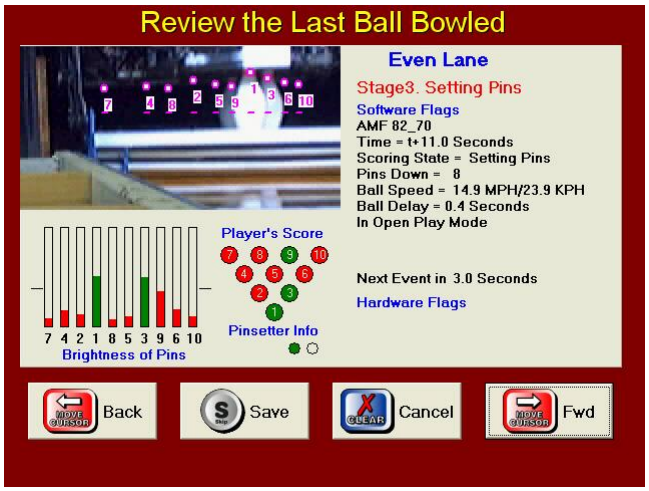
   The only exception to this is a Brunswick A machine where the Rake and Deck move together on first ball. In this case, the score is determined before the Rake falls. Make sure that the Rake is not blocking the pins.

Stage 3. Setting Pins

This stage represents the expiry of the ***Score Taken to Pins Set*** timer. It is at this point the Duo software will start looking to see when the image has stopped moving and the cycle has completed.

Again, this timer can be adjusted from the ***Fine Tune the Scoring Setup*** screen, but they have been pre-configured for each type of Pinsetter and should not need to be altered.

In this example, the default ***Delay from Pins Set to Pinsetter at Rest*** is 3.0 seconds. Therefore, the next stage (Event) will occur at that time.



Stage 4. Scoring Cycle Ended

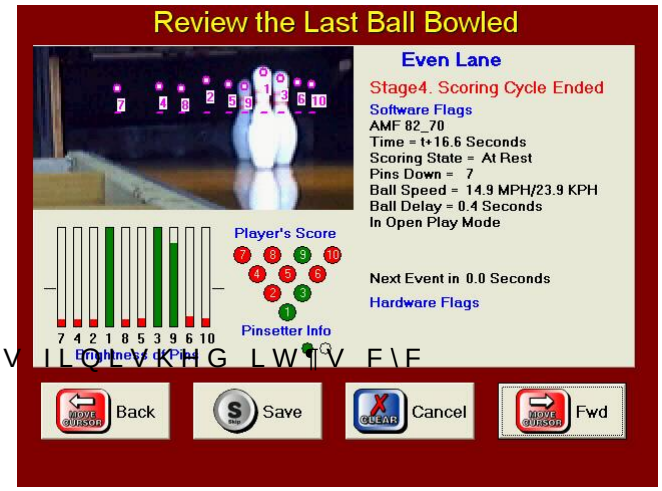
The final stage represents when the Pinsetter has completed its cycle, either by observing that all movement has finished, or by the expiration of the ***Pins Set to Pinsetter at Rest timer***, whichever occurs first.

Again, this timer can be adjusted from the ***Fine Tune the Scoring Setup*** screen, but they have been pre-configured for each type of Pinsetter and should not need to be altered.

Things to Check

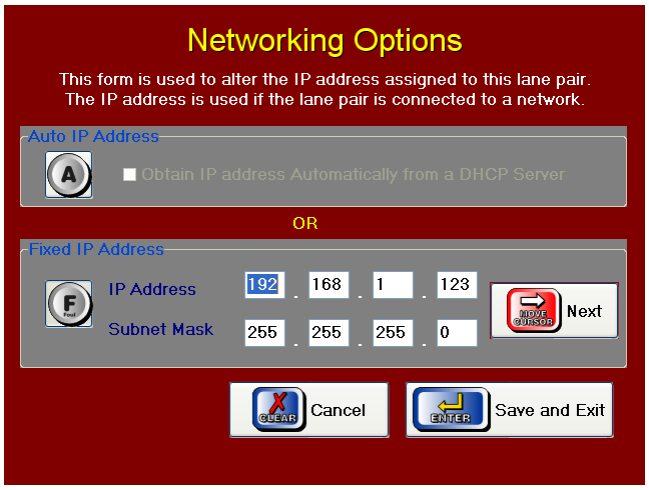
If you are having scoring issues, check the following areas:

1. & K H F N W K D W W K H 3 L Q V H W V D U H V W D W L R Q D U \ L Q W K H L P D J H V W D E O H V W D W L R Q D U \ L Q W K H L P D J H , I L Q L V K H G L W ¶ V F \ F stationary in the image. If the machine is still in motion, you can extend ***the Delay from Pins Set to Pinsetter at Rest*** in the ***Advanced Tuning Screen***.



Network Connection Options

The Network Options screen is accessed by pressing on the ***N*** button from the Troubleshooting screen and is concerned with how the Duo Hardware Module will communicate with the lane control computers (If installed) The Duo Hardware Module uses the TCP/IP protocol and as such needs an IP address before it can communicate with others. This IP address can either be automatically assigned from a DHCP server (or use an automatic private IP address if no DHCP is found) or the IP address can be manually assigned using a fixed IP address.


Networking Options
This form is used to alter the IP address assigned to this lane pair.
The IP address is used if the lane pair is connected to a network.
Auto IP Address
A
Obtain IP address Automatically from a DHCP Server
OR
Fixed IP Address
F
IP Address
192 . 168 . 1 . 123
Subnet Mask
255 . 255 . 255 . 0
Next
Cancel
Save and Exit

Computer administrators often prefer to fix IP addresses because it gives them more control and allows them to know exactly what the IP address is for every device on a network. However, IP addresses are usually set to Automatic so that each Duo unit will attempt to obtain its own IP address based on what it can see on the network, or ideally be assigned an IP from a Network Router which includes a DHCP function.

Auto IP Address

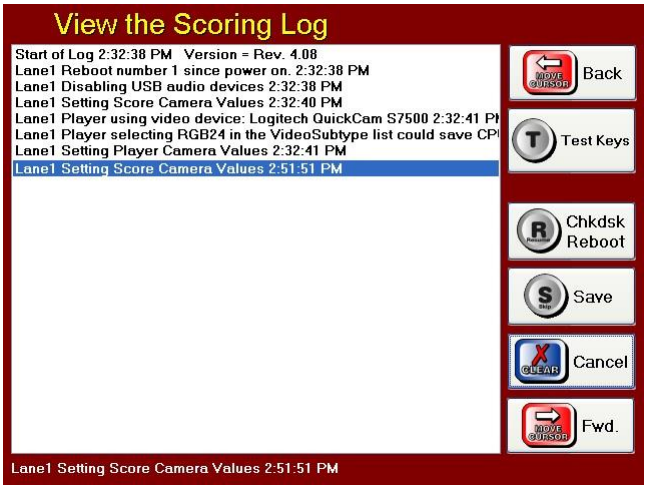
At any time the Automatic IP address can be set by pressing the ***A*** button. This will cause the Duo Hardware Module to look for a DHCP server (Router) and obtain an IP address from it. Even if no DHCP server exists, the Duo unit will still give itself an IP address after one minute. If you are unsure, select Auto IP Addresses.

Fixed IP Address

To fix the IP address to a desired value, press the ***F*** button and then type the desired IP address and Subnet Mask. For more information on IP addresses, see your network administrator.

Viewing the Scoring Log

The Scoring Log is accessed by pressing the ***V*** button and shows you a list of every system message that has been generated by the Duo unit. This log is useful in diagnosing system problems and is often requested by Duo support staff to help determine the sequence of events with system issues.


View the Scoring Log
Start of Log 2:32:38 PM Version = Rev. 4.08
Lane1 Reboot number 1 since power on. 2:32:38 PM
Lane1 Disabling USB audio devices 2:32:38 PM
Lane1 Setting Score Camera Values 2:32:40 PM
Lane1 Player using video device: Logitech QuickCam S7500 2:32:41 PM
Lane1 Player selecting RGB24 in the VideoSubtype list could save CPU
Lane1 Setting Player Camera Values 2:32:41 PM
Lane1 Setting Score Camera Values 2:51:51 PM
Back
Test Keys
Chkdsk Reboot
Save
Cancel
Fwd.
Lane1 Setting Score Camera Values 2:51:51 PM

Saving the System Log

The system log can be saved to a text file by pressing the S button. This will save the file onto the Duo Hardware 0 R G X O H ¶ V K D U\Computer Score\ScoreWXRXX&log where XX is the lane pair of the Duo Module. This file can then be e-mailed to your support representative upon their direction.

Reboot and run Check Disk

This button allows you to restart the Duo CPU unit and schedules the windows Check Disk function to run automatically when the unit is restarted. When you press the ***R*** button, the unit will immediately shut down, reboot, and then run the Check Disk function.

There is <u>no</u> requirement to perform this function on a regular basis, and should only be done when errors are displaying over the top of the play grid when the Duo CPU unit is started in the mornings and on advice of your Computer Score support personnel.

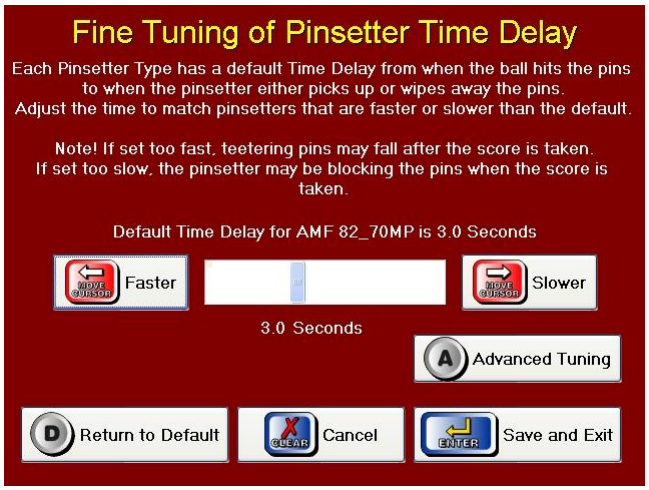
Fine Tuning the Scoring Setup

The next option in the Troubleshooting Screen allows you to Fine Tune the Scoring Setup by modifying the timing of the scoring software. Press the ***F*** button to enter this screen.

As already shown in the Reviewing the Last Score section of this manual, the scoring software relies on the H[SLU\ RI WKUHH WLPHUV WR KHOS GHWHUPLQH WKH FRUUHFW VFRUH DW

Take Data Delay

The Take Data Delay is by far the most important timer for scoring reliability. This represents the amount of WLPH IURP ZKHQ WKH 3LQVHWWHU¶V F\FOH VWDUWV WR ZKHQ WKH VFRUH of Pinsetter, and should only be changed if your Pinsetter is faster or slower than usual. A good example of this are Brunswick A2 machines modified with a quick drop rake. This would require the delay to be set a little bit faster.


Fine Tuning of Pinsetter Time Delay
Each Pinsetter Type has a default Time Delay from when the ball hits the pins to when the pinsetter either picks up or wipes away the pins.
Adjust the time to match pinsetters that are faster or slower than the default.
Note! If set too fast, teetering pins may fall after the score is taken.
If set too slow, the pinsetter may be blocking the pins when the score is taken.
Default Time Delay for AMF 82_70MP is 3.0 Seconds
Faster
Slower
3.0 Seconds
Advanced Tuning
Return to Default
Cancel
Save and Exit

To make the delay shorter press the ***Move Cursor Left*** button repeatedly, to make the delay longer press the ***Move Cursor Right*** button repeatedly. To set the delay back to the default amount for the selected Pinsetter, press the ***D*** button.

To modify the other two timers, press the ***A*** button to view the Advanced Pinsetter Timings screen.

Advanced Pinsetter Timings

The Advanced Pinsetter Timings screen allows you to change the other two time delays in the scoring software as already discussed in the Review the Last Score section. These time delays are preset depending on the type of Pinsetter chosen in the Setup Wizard and should not need to be altered.

The only time they would need to be changed is if the images in the Review the Last Score screen show the Pinsetter still in motion in Stage 4.

To change either timer, press 1 or 2 respectively and then press Move Cursor Left or Move Cursor Right buttons repeatedly until the timer is at the desired length. Press ***D*** to set the delay back to the default time.

Synchronise the frame to 1st Ball

This button will enable or disable the failsafe feature called FrameSync. FrameSync is usually set ON.

FrameSync is a method of making sure that the Pinsetter and the Duo unit are both on first ball or second ball, by looking at the action of the Pinsetter to see if the Pins are picked up (First Ball) or wiped away. (Second Ball) If the Duo is on second ball and a first ball score is detected, then the new score will overwrite the old one, making sure that the Pinsetter and the Duo are both now on second ball.

Adjust Camera

'XR DOORZV \RX WR KDYH WKH RSWLRQ RI D VHFRQG FDPHUD WKDW FD when delivering the ball. If this 2nd camera is present, then the first screen shown when selecting the ***Adjust Camera*** function allows you to select which camera you would like to adjust.

Make sure that the correct camera image is being shown in the correct location. If the wrong image is being shown, (Eg: Score Camera Image being shown in the Player Camera position) then you can swap the cameras by pressing the ***C*** Key.

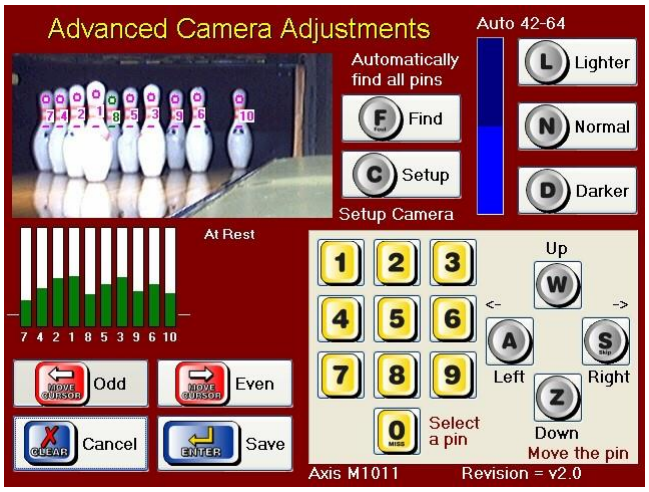
Press ***1*** to Manually adjust the Score Camera, Press ***2*** to adjust the Player Camera.

Note: If you do not have the optional Player Camera installed, then selecting the ***Adjust Camera*** function will go straight into the ***Score Camera*** section, below.

Score Camera

The Advanced Camera Adjustments screen has three functions. All these functions should be correctly set after completing the Setup Wizard. You should only change these settings from the default if you repeatedly encounter scoring problems.

Select which lane to change by pressing the ***Move Cursor Left*** button for the Odd Lane or ***Move Cursor Right*** for the Even Lane.



Find the Pins

Press the ***F*** button to automatically re-configure all the pins for the selected lane, the same as during the Wizard. Often, if a Pin is incorrectly detected, then pressing ***F*** a second time will then correctly find the pin. ***It is very rare to have to manually move the Pin Position Indicators.***

Manually Moving a Pin

If a pin is incorrectly detected repeatedly when doing the Automatic procedure, then it may be necessary to manually specify the Pin Position Indicator. The real cause of this is most likely due to poor lighting in the pit area. Consider swapping fluorescent tubes to white, high brightness tubes known as Triphosphorus.

If this is not immediately practical, then you can manually set a pin position. To do this, press the number for the desired pin. (Press ***0*** for the 10 pin) In this example, the 8 pin is green to show that it has been selected. Once selected, move the Pin Position Indicator by pressing the ***W*** for Up, ***A*** for Left, ***S*** for Right & ***Z*** for Down until the Indicator Dot is in the middle of the head of the pin.

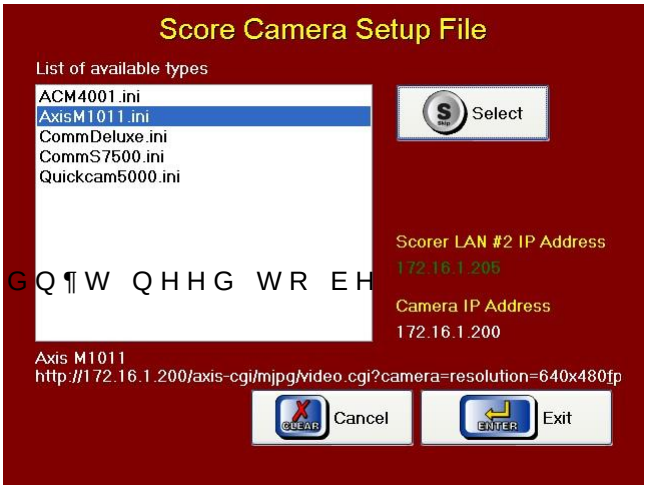
Changing Brightness Levels

The brightness level indicator is shown in the top right corner of the screen and acts as an electronic iris for the camera. Press the ***L*** button to make the image lighter and press the ***D*** button to make the image darker. Press the ***N*** button to set the brightness back to the default level.

This adjustment is pre-set and should only need to be changed if the image is excessively bright or dark. If the image is too dark, a pin that is standing may not be bright enough to be above the brightness threshold, therefore the Duo will think the pin has been knocked down. If the image is too light, then a pin that has been knocked over could still be detected because the pit is too bright.

Specify the type of Camera

Press the ***C*** button to enter the Score Camera Setup screen. This screen allows to you specify what type and model of score camera is present by pressing the ***S*** button repeatedly until the desired camera type is highlighted.



Note: This setting is correctly set in the I D F W R U \ D Q G V K R X O G Q ¶ W Q H H G W R E H changed, unless on the advice of your Computer Score support representative.

Player Camera

The Player Camera screen is a convenient spot to allow you to point the camera in the correct direction and rotation to give a good image of the foul line as shown below.

Press the ***Enter*** Key to Save the settings and return to the Troubleshooting Menu.

Zoom In and Adjust position

Once the correct camera orientation and rotation has been done and the camera has been secured, you can then adjust the camera zoom and position via the software.

By default, the camera field of view is set to max Zoom out. If desired, you can Zoom the image In using the ***I*** key. Once the image is Zoomed in, you can adjust the image position by pressing the ***W*** for Up, ***A*** for Left, ***S*** for Right & ***Z*** for Down.

Press ***C*** key to place the camera back to the default, centered position. Press the ***O*** key to Zoom Out.

Save Last Delivery

The Duo CPU Module buffers the Player Camera for the last delivery made on each lane. It is possible to Save this video to a file for either the Odd or the Even lane.

This may be useful in a situation where, say, the bowler steps over the foul line and injures him or herself. Press the ***← Move Cursor*** key to save the video for the Odd Lane.

The network path for the file is ***\\SOLOXX-XX\COMSCORE\ODDPLAYER.AVI*** where XX-XX is the lane numbers. Press the ***→ Move Cursor*** key to save the video for the Even Lane.

The network path for the file is ***\\SOLOXX-XX\COMSCORE\EVENPLAYER.AVI*** where XX-XX is the lane numbers.

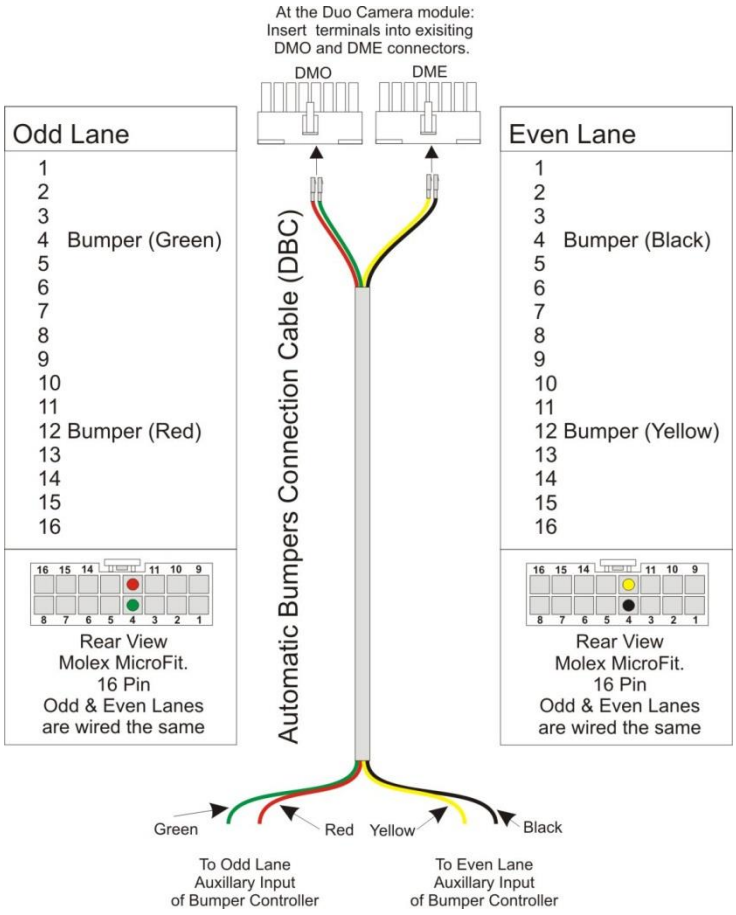
<RX FDQ WKHQ XVH :LQGRZV ([SORUHU WR EURZVH WR WKH 'XR¶V +DU

Note: When the video is saved, any existing file will be overwritten.
Only the last ball bowled for each lane is kept in memory, so it is only possible to save the desired ball if there has been no further bowling done on that lane.
(As is likely to be the case with an injury)

AMF (and others) Automatic Bumpers

The Majority of Automatic Bumpers can be activated up or down by the closure of a switch. The Duo Units include a relay for this purpose. The contacts for this replay can be found on pins 4 and 12 of the Machine Connection plugs for both the Odd and Even lanes. Run the Automatic Bumper Connection cable (SBC) from the Duo Hardware Unit to the Automatic Bumper Controller for your bumpers.

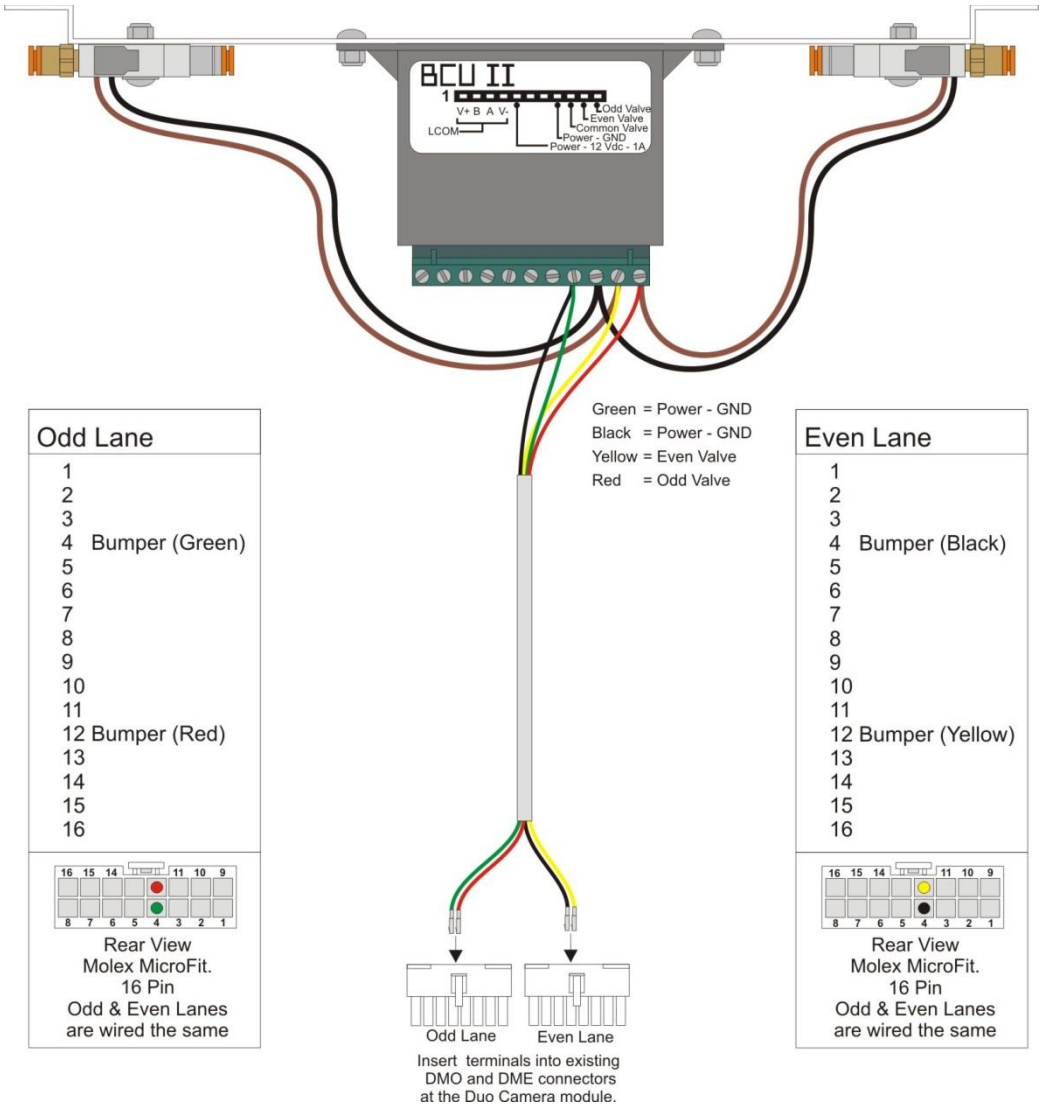
Note: The relay on the Duo Unit will only handle the switching of low voltage (or preferably no voltage) only. DO NOT attempt to place any high voltage across the relay contacts or you WILL DAMAGE the Duo unit. If you are unsure how to connect your Automatic Bumpers, contact the manufacturer of the bumper units.



1. Setup Duo CPU Module

The Duo CPU Module must be configured to control automatic bumpers. This is done from Step 3 of the Setup :L]DUG DV GHVFULEHG LQ WKH ³8VLQJ WKH 6HWXS :L]DUG´ VHFWLRQ RI WK

An example of this arrangement is the Qubica AMF BCUII Bumper Control Unit. The Duo Bumper contacts are wired in parallel with the pneumatic relays that are part of this controller.



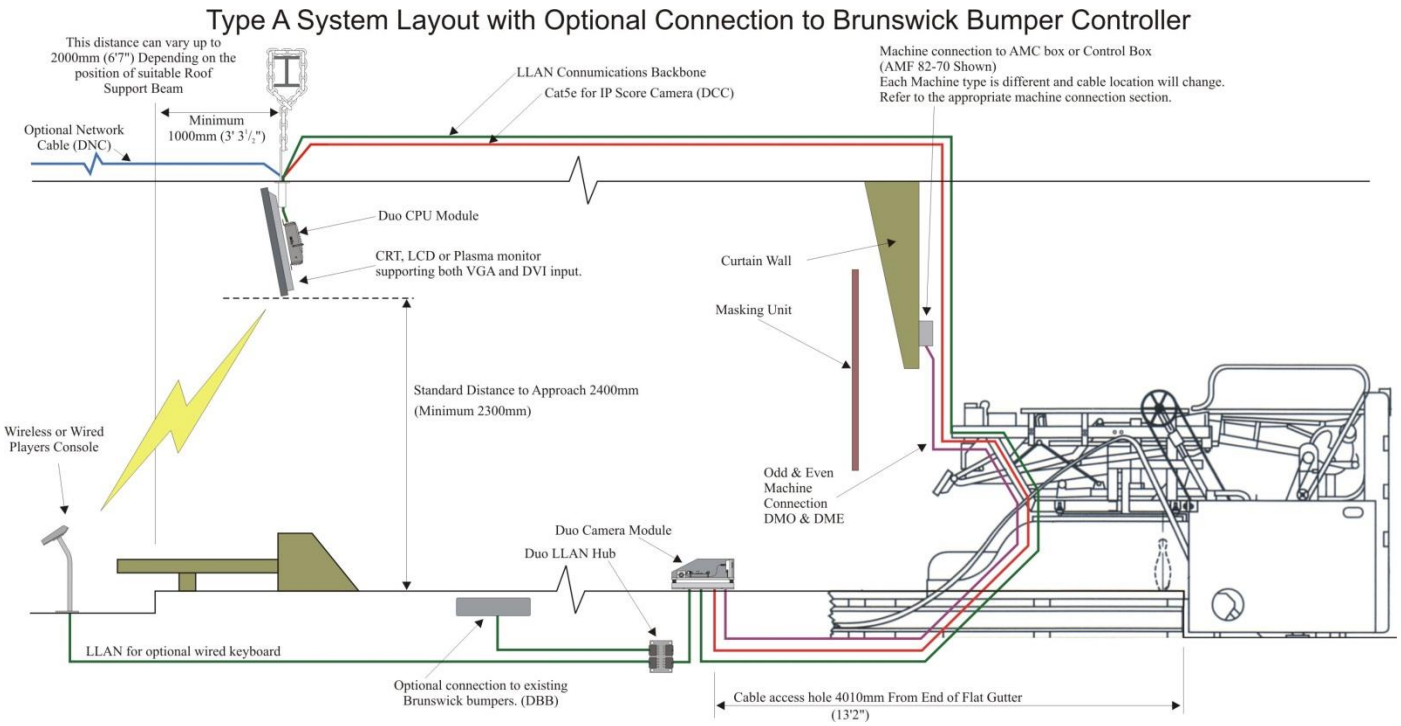
2. Setup Center Command

1. Make sure that the Duo units have Automatic Bumpers enabled, as described in Step 3 of the Setup Wizard.
2. Run the Center Command Score software and go to the System Management menu and click on Control Setup.
3. When the Control Setup screen appears, click on the Center Setup tab.
4. Edit and change the Bumpers drop down list to ***AMF Bumpers***.
5. Place a Tick in the field ***Name entry required after Start Open Play***
6. Save and exit Center Command back to Windows
7. Reboot the Computer.

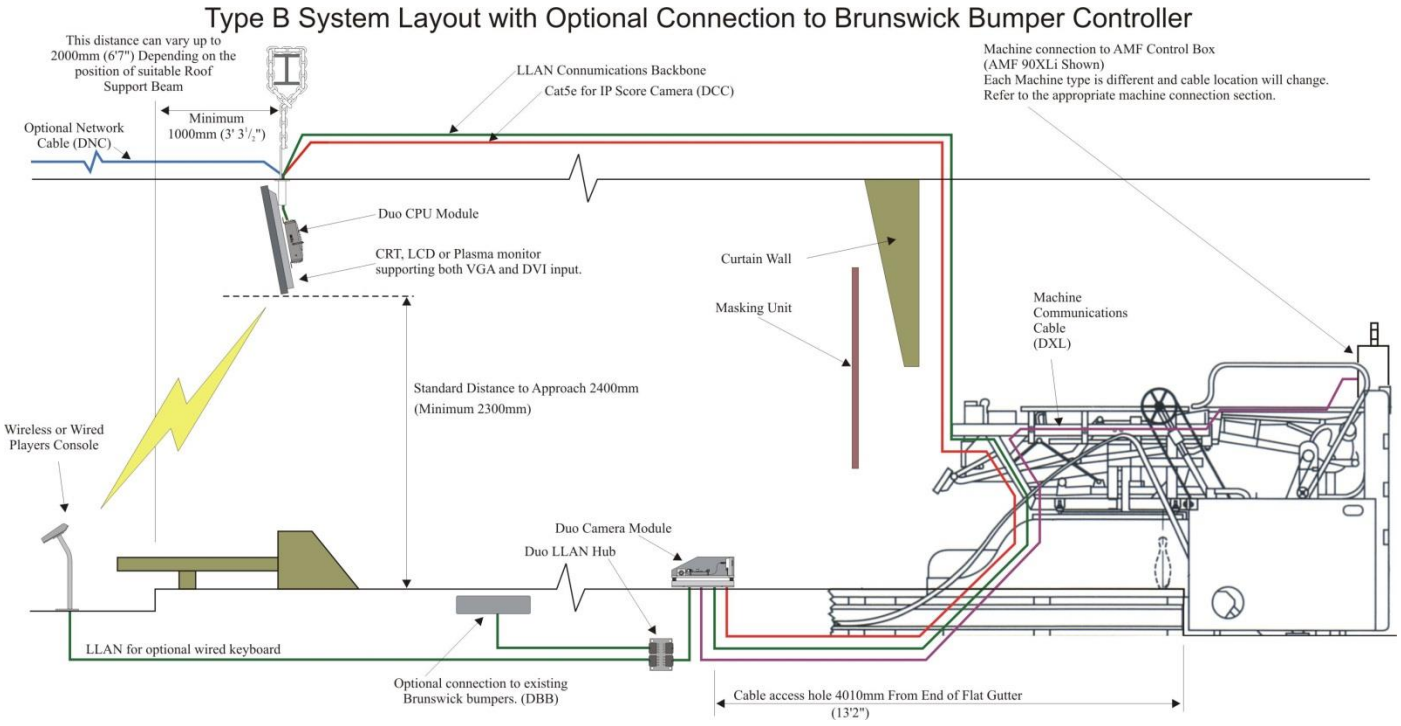
Brunswick Automatic Bumpers

Most automatic bumper systems are designed so that they are operated by the closure of a switch contact so that when the switch is closed, the bumpers go up and when the switch is open the bumpers will go back down. The one exception to this rule is the Brunswick Automatic Bumper system, which is controlled on a communications network via a control box under the lanes. The Duo system is able to directly control the Brunswick Bumper Controller by supplying a LLAN Hub and an additional LLAN cable.

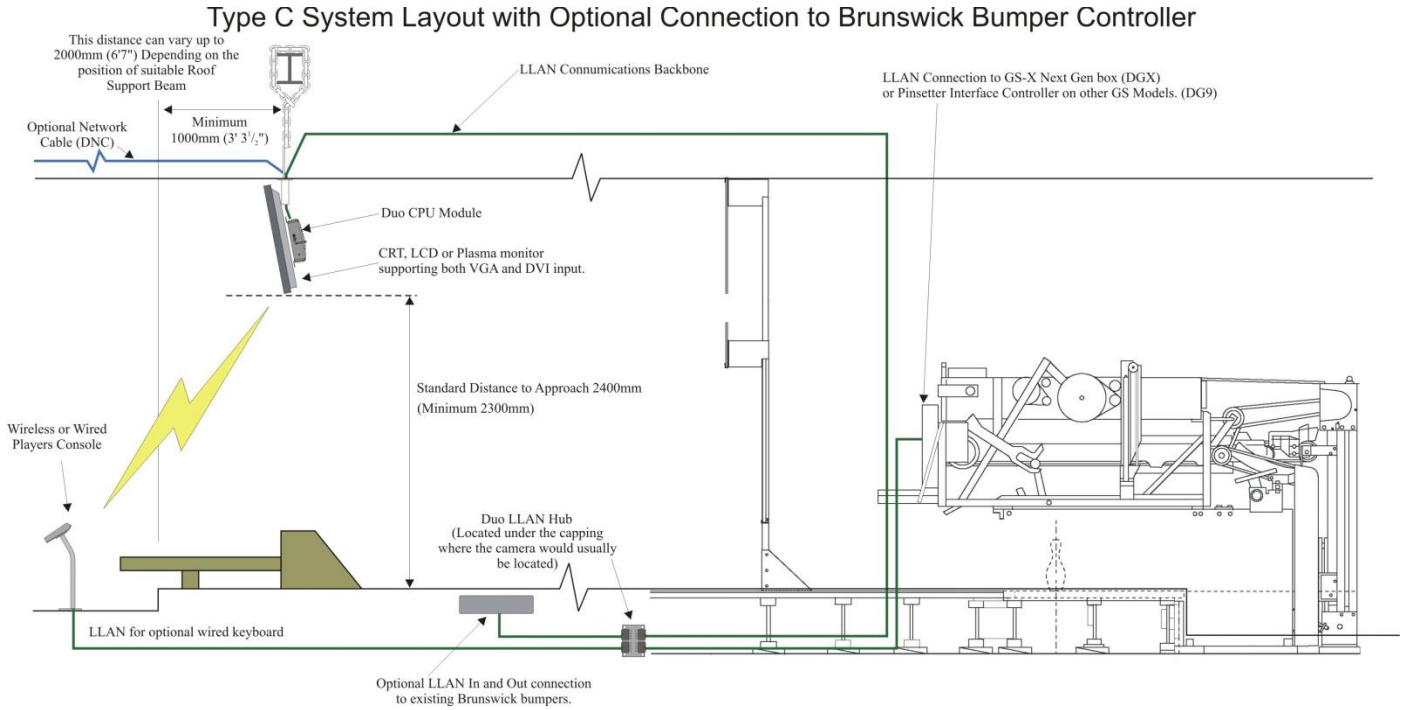
Type A Systems


Type A System Layout with Optional Connection to Brunswick Bumper Controller
This distance can vary up to 2000mm (6'7") Depending on the position of suitable Roof Support Beam
Minimum 1000mm (3' 3 1/2")
Optional Network Cable (DNC)
LLAN Connumications Backbone
Cat5e for IP Score Camera (DCC)
Machine connection to AMC box or Control Box (AMF 82-70 Shown)
Each Machine type is different and cable location will change.
Refer to the appropriate machine connection section.
Duo CPU Module
CRT, LCD or Plasma monitor supporting both VGA and DVI input.
Curtain Wall
Masking Unit
Standard Distance to Approach 2400mm (Minimum 2300mm)
Wireless or Wired Players Console
Odd & Even Machine Connection DMO & DME
Duo Camera Module
Duo LLAN Hub
LLAN for optional wired keyboard
Optional connection to existing Brunswick bumpers. (DBB)
Cable access hole 4010mm From End of Flat Gutter (13'2")

Type B Systems


Type B System Layout with Optional Connection to Brunswick Bumper Controller
This distance can vary up to 2000mm (6'7") Depending on the position of suitable Roof Support Beam
Minimum 1000mm (3' 3 1/2")
Optional Network Cable (DNC)
LLAN Connumications Backbone
Cat5e for IP Score Camera (DCC)
Machine connection to AMF Control Box (AMF 90XLi Shown)
Each Machine type is different and cable location will change.
Refer to the appropriate machine connection section.
Duo CPU Module
CRT, LCD or Plasma monitor supporting both VGA and DVI input.
Curtain Wall
Masking Unit
Machine Communications Cable (DXL)
Standard Distance to Approach 2400mm (Minimum 2300mm)
Wireless or Wired Players Console
Duo Camera Module
Duo LLAN Hub
LLAN for optional wired keyboard
Optional connection to existing Brunswick bumpers. (DBB)
Cable access hole 4010mm From End of Flat Gutter (13'2")

Type C Systems


Type C System Layout with Optional Connection to Brunswick Bumper Controller
This distance can vary up to 2000mm (6'7") Depending on the position of suitable Roof Support Beam
Minimum 1000mm (3' 3½")
Optional Network Cable (DNC)
LLAN Connumications Backbone
LLAN Connection to GS-X Next Gen box (DGX) or Pinsetter Interface Controller on other GS Models. (DG9)
Duo CPU Module
CRT, LCD or Plasma monitor supporting both VGA and DVI input.
Standard Distance to Approach 2400mm (Minimum 2300mm)
Wireless or Wired Players Console
Duo LLAN Hub (Located under the capping where the camera would usually be located)
LLAN for optional wired keyboard
Optional LLAN In and Out connection to existing Brunswick bumpers.

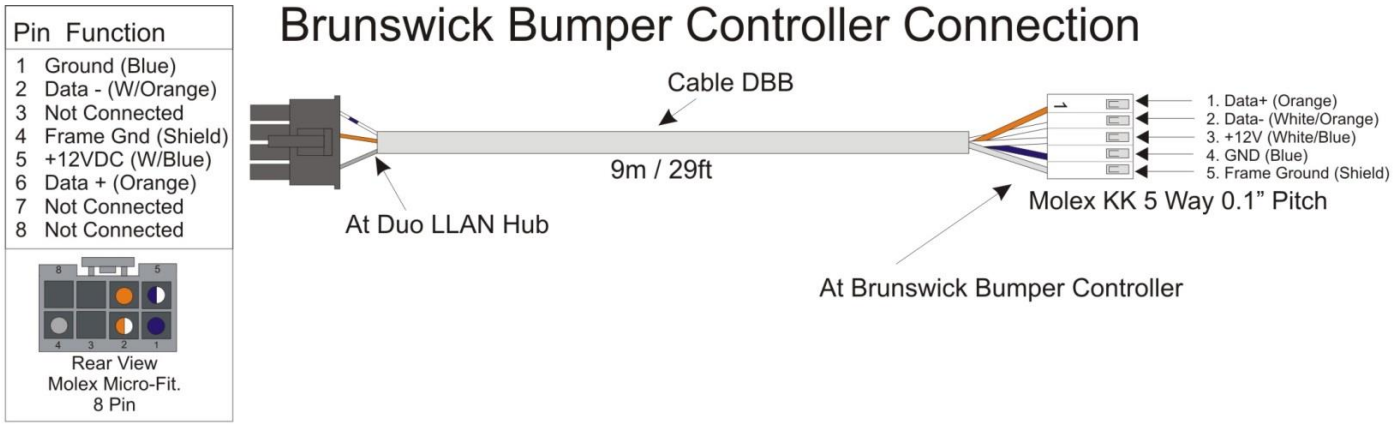
Note: This method of operating Brunswick Bumpers is only valid for Pinball Wizard bumpers or later. If you have automated Ball Wall Bumpers, please contact your Computer Score support representative for advice on KRZ WR EHVW LQWHJUDWH %DOO :DOO LQWR 'XR¶V RSHUL

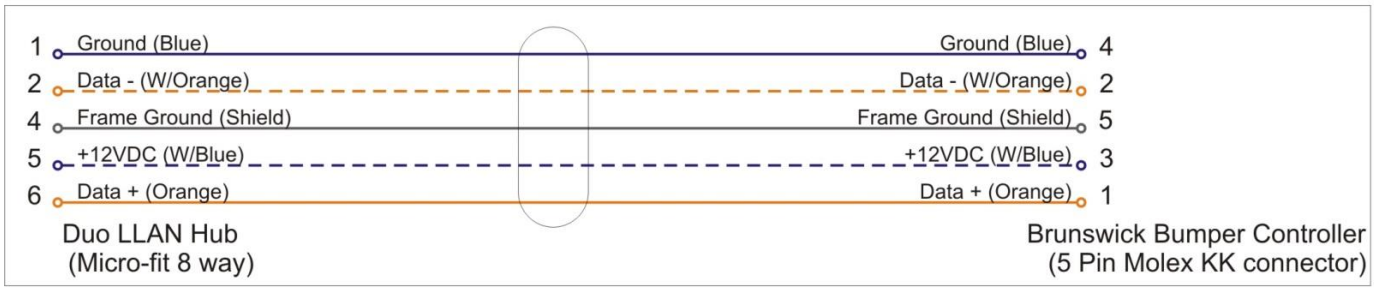
1. Configure the Brunswick Bumper Controller

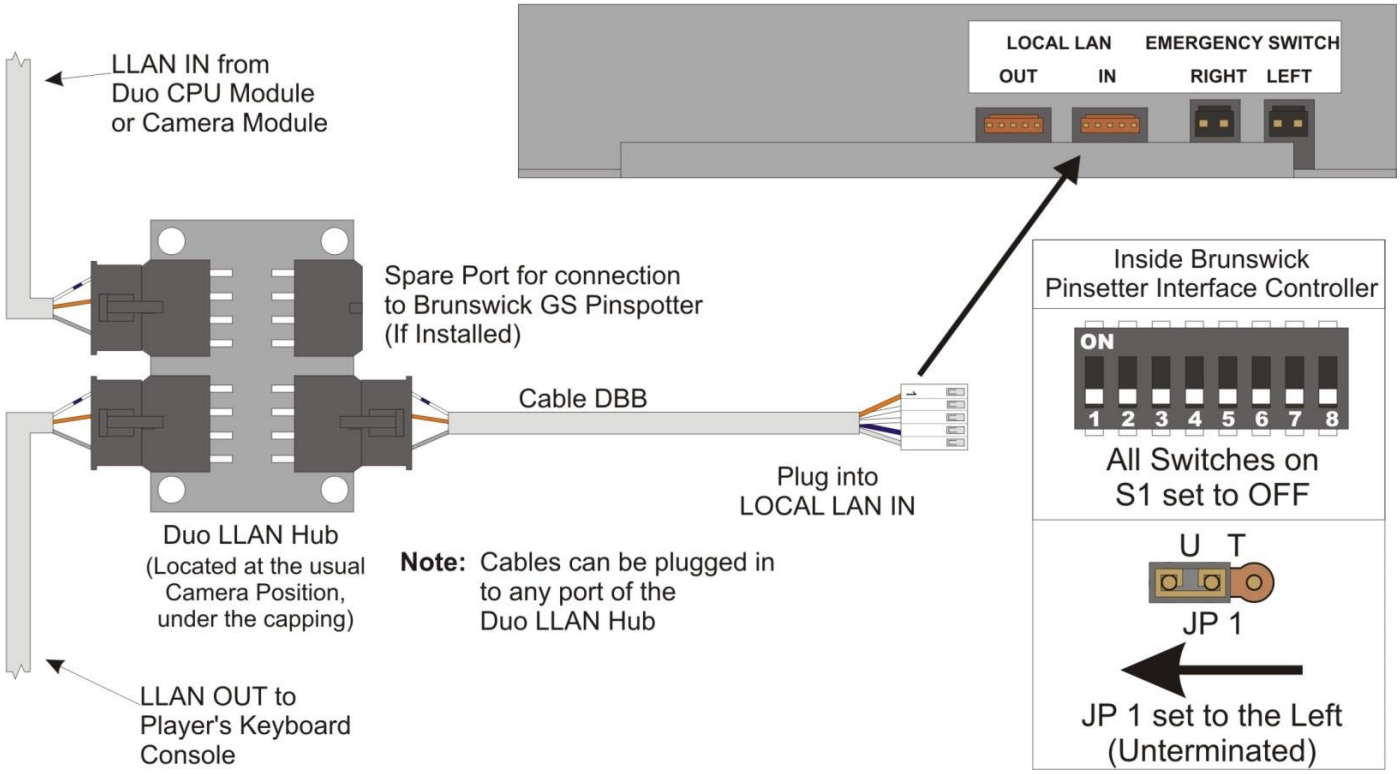
Each Bumper Controller, which is located under each lane pair, approx. mid way up the lane, must be configured to Frameworx mode in order to function with the Duo system.

To do this, follow these steps:

1. Pull out the power cable to isolate the Brunswick Bumper Controller and make it safe to work on.
2. Remove the top cover of the Controller.
3. Set all 8 Switches on DIP Switch S1 to the OFF position.
4. Ensure jumper on JP1 is set to U (Un-terminated)
5. Replace the top cover of the Controller.
6. Plug the power cable to re-activate the controller.




1 Ground (Blue) Ground (Blue) 4
2 Data - (W/Orange) Data - (W/Orange) 2
4 Frame Ground (Shield) Frame Ground (Shield) 5
5 +12VDC (W/Blue) +12VDC (W/Blue) 3
6 Data + (Orange) Data + (Orange) 1
Duo LLAN Hub
(Micro-fit 8 way)
Brunswick Bumper Controller
(5 Pin Molex KK connector)



2. Setup Duo CPU Module

The Duo CPU Module must be configured to control automatic bumpers. This is done from Step 3 of the Setup :L]DUG DV GHVFULEHG LQ WKH ³8VLQJ WKH 6HWXS :L]DUG´ VHFWLRQ RI WK

3. Setup Center Command

1. Make sure that the Duo units have Automatic Bumpers enabled, as described in Step 3 of the Setup Wizard.
2. Run the Center Command software and go to the System Management menu and click on Control Setup.
3. When the Control Setup screen appears, click on the Center Setup tab.
4. Click on Edit and change the Bumpers drop down list to ***Brunswick Bumpers***.
5. Place a Tick in the field ***Name entry required after Start Open Play***
6. Save and exit Center Command back to Windows
7. Run Center Command again to activate the bumper functionality.

Using Automatic Bumpers

There a three ways of controlling the bumpers from the Center Command Software.

Method 1: Via the Name Entry Screen.

Bumpers can be set up or down on an individual Bowler by bowler basis.

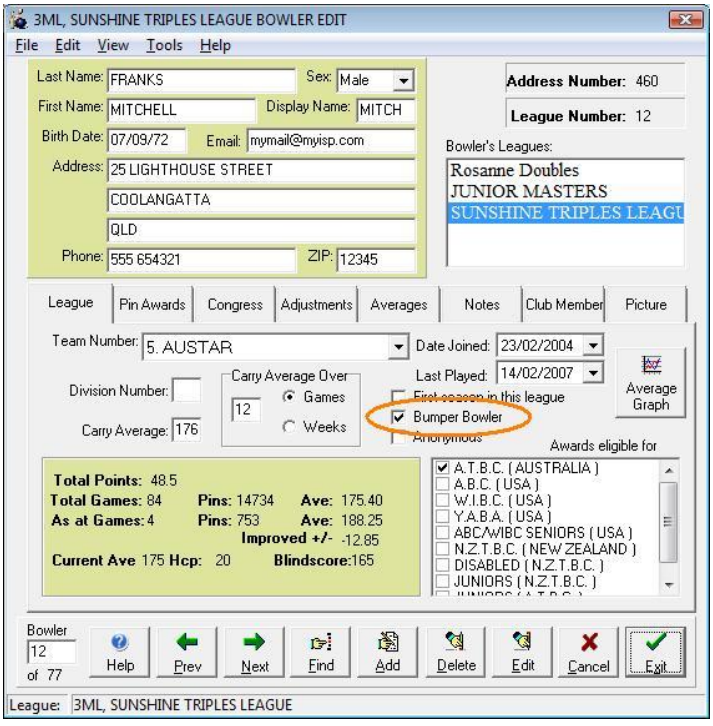
1. Click on an individual Lane (Name entry is not valid if multiple lanes are selected)
2. Click on the ***Name Entry*** button and then select the bumper icons on the desired bowlers. This will still work even if no names have been entered yet.
3. Click on ***OK*** and the bumper will raise on Bill, Ness D Q G + D Q N ¶ V W X U Q D Q G D X W R P D W L F D O O \ O R Z H U R Q - D Q H) U D Q N D Q G 7 R P ¶ V

Note: To minimise wear and tear on the bumper mechanism, you should group bowlers with bumpers together.

Method 2: Via League Setup

Individual bowlers can be specified as bumper bowlers on a league by league basis. This is only available if the League Secretarial package has been enabled in the Register Software screen.

1. Click on the ***Bowler Details*** button in the ***League Secretary*** menu.
2. Edit the desired bowler and click on the ***Bumper Bowler*** check box.
3. When that bowler bowls in that league (In other Leagues he or she can bowl normally) the bumpers will automatically raise during his or her turn.



Method 3: Via the Override buttons.

Bumpers can also be raised or lowered for the entire lane, irrespective of what players are bowling.

1. Select the lane or lanes you want to control.
2. Click on the ***Overrides Tab*** in the Control Lanes screen.
3. Click on the ***Raise Bumpers*** button to raise the bumpers irrespective of who is on the lanes.
4. Click on the ***Lower Bumpers*** button to remove bumpers of the selected lane or lanes irrespective of who is bowling.
5. Click on the ***Bumpers Auto*** button to set the bumpers back to Automatic Computer control.

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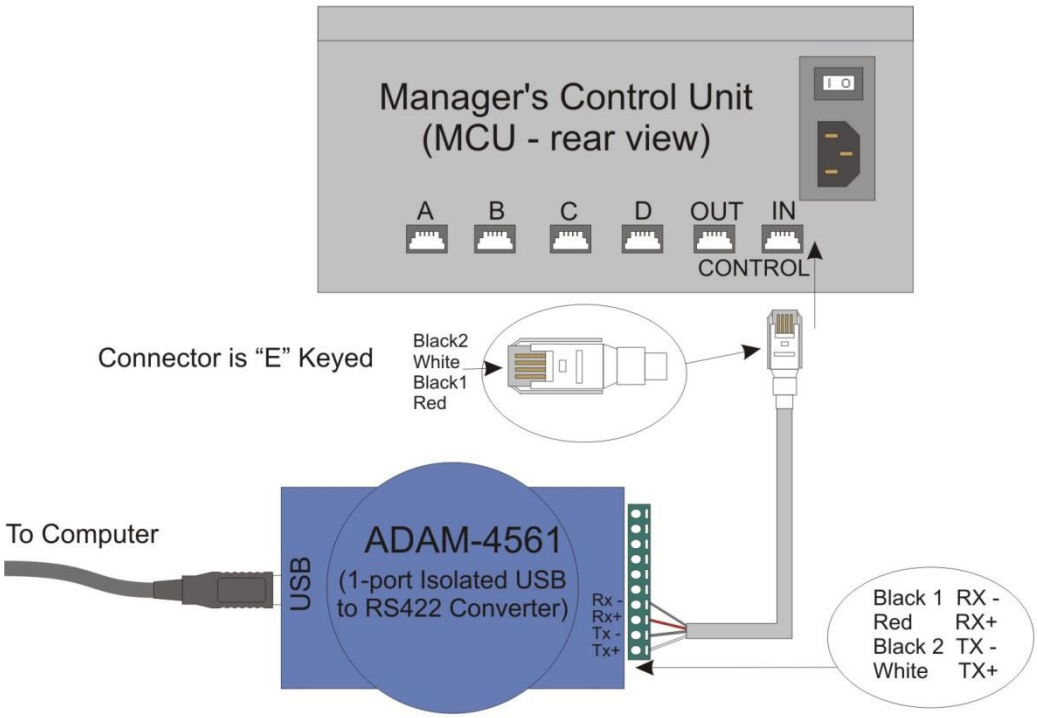
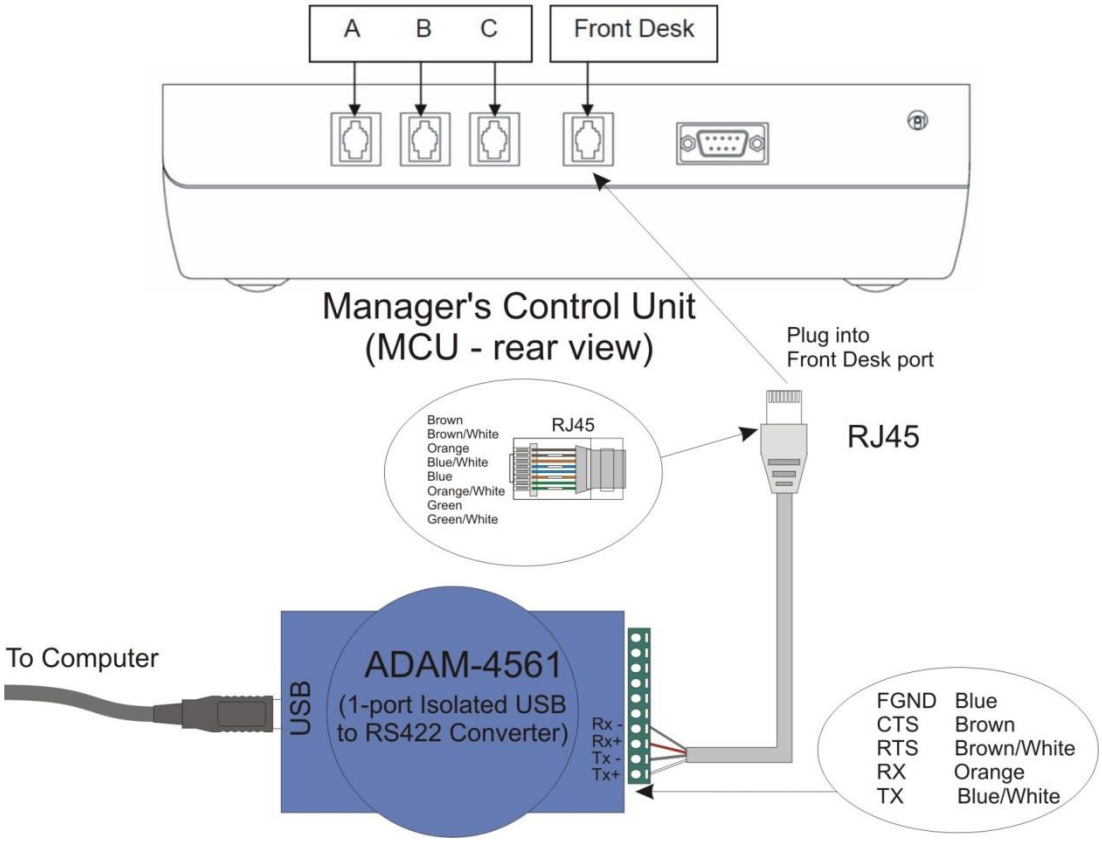
AMF 82-90, 8800 Gold and 82-90XL Pinsetters do not include a mechanism to turn the machine On or Off by ZD\ RI GLUHFW FRQQHFWLRQ WR WKH SLQVHWWHU¶V HOHFWURQLFV ,QVW interface box on the Control Counter, called the Managers Control Unit (MCU). Center Command includes software to connect a USB to RS-422 serial converter from a computer to the MCU. This software runs on the Windows System Tray (Systray) and sends commands to the MCU to tell it to turn the 82-90 machines on and off at the appropriate time.

Connection from computer to MCU (Old Type MCU)



Connection from computer to MCU (New Type MCU)



Note: 90XLi and 70XLi pinsetters do not require MCU connection. The machine start function is done via the Cam/Scoring plug on the XLi chassis. Other chassis do not have this facility, and so require the MCU connection as above.

Note: Some MCUs that have been installed in a stand-alone center may have the LIU function turned off. Your MCU must have the LIU functionality enabled. Use Spec 10 to enable this function.

Installing the MCU Interface Controller

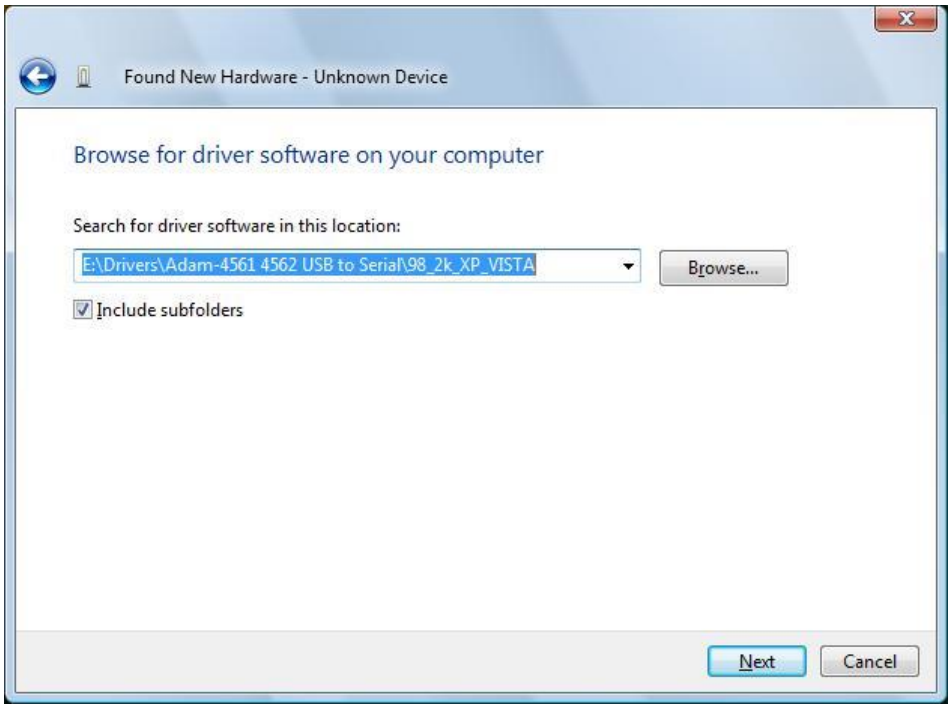
To install the Windows Bumper Interface controller, there are three basic stages:

A. Install driver for USB to RS232 converter
B. Create a Startup Shortcut
C. Setup the Center Command Software

There are several steps in each of these stages, however anyone with a good general knowledge of Windows can perform them.

A. Install driver for USB to RS232 converter

1. ,QVHUW 86% SOXJ LQWR D IUHH 86% VRFNHW DW WKH UHDU RI WKH FRP appear.
2. The computer will automatically search for a software driver, but will probably not find one. If this is so, select the option to browse for the correct driver.
3. Insert the Center Command Installation CD into the CD drive. When the Computer Score Setup program starts, cancel it.
4. In the Found New Hardware Wizard, click on ***Browse*** and navigate to the ***Drivers\ADAM-4561 4562 USB to Serial\98_2K_XP_VISTA*** folder on your CD drive.



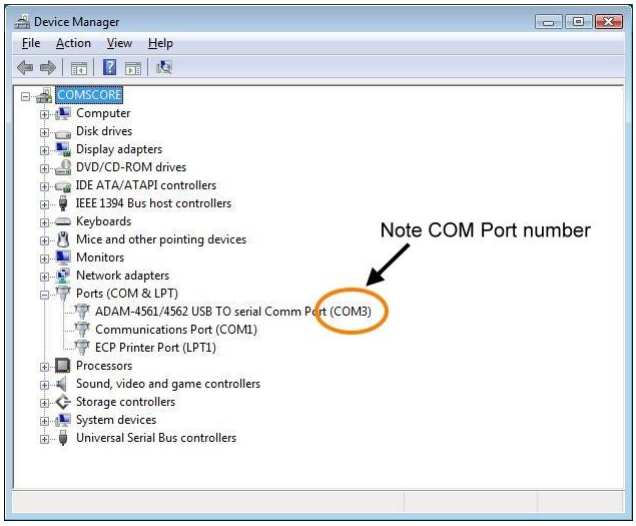
5. :KHQ WKH VFUHHQ VWDWLQJ WKDW ³:LQGRZV FDQ¶W YHULI\ WKH SXEOLVKHU RI WKLV GULYHU VRIWZDUH´ DSSHDUV FOLFN ***Install this Driver Software Anyway*** button.

Windows Security
Windows can't verify the publisher of this driver software
Don't install this driver software
You should check your manufacturer's website for updated driver software for your device.
Install this driver software anyway
Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
See details

6. When complete click finish.

B. Create Startup Shortcut

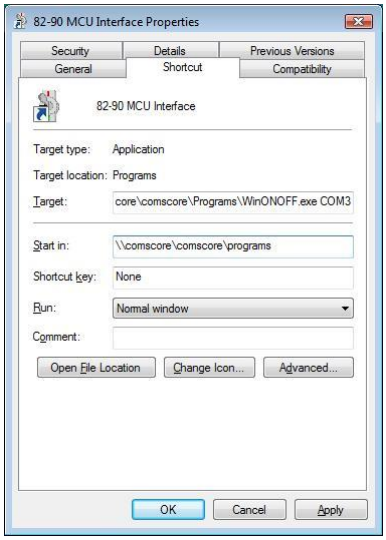
1. Right click ***My Computer*** and select properties.
2. Click on the ***Device Manager*** task.
3. Click on the Plus sign next to ***Ports (COM & LPT)***
4. Note the COM number at the end of ADAM-4561 USB to RS232/422/485 Comm Port (Usually COM3 but it can be different)
5. Exit Device manager and System Properties back to Windows Desktop.



6. Right click on the Desktop and select ***New → Shortcut***
7. When the create shortcut wizard appears asking you to Type the Location of the Item, type the following:

   C:\COMSCORE\PROGRAMS\WINONOFF.EXE COM3
   or
   \\COMSCORE\COMSCORE\PROGRAMS\WINONOFF.EXE COM3

   in the area provided and click ***Next***. (Substitute the correct COM port number if different to COM3. Also note there is a space before COM)
8. Type a name for the shortcut, such as **82-90 MCU Interface** and click Finish.
9. This should create a Shortcut to the Bumper Interface program on the desktop.
10. Drag and Drop the Shortcut into the ***Start → All Programs → Startup*** folder to make sure that the Interface program is running every time this computer is started.



C. Setup the Center Command Software

1. Open ***My Computer*** and browse to the ***P:*** drive. Create a new folder inside and name it ***ONOFF*** (No spaces in the name)
2. Run the Center Command software by double clicking on the desktop icon. Go to the System Management menu and click on Control Setup.
3. When the Control Setup screen appears, click on the Center Setup tab.
4. Make sure that the Pinsetter Type field is set to AMF 82/90 XL
5. Reboot the computer to start the MCU interface.

Using the MCU Interface

Once the Computer has been rebooted, you should see the WinOnOff icon down on the bottom right of the Windows taskbar, near the time.

This is the interface software that sends out MCU commands out to the Pinsetters to turn on the lanes via the MCU. There is nothing that need to be done by the operator in order to achieve this, it will occur automatically whenever the software is running. The interface MUST be running in order for the Pinsetters to turn on and off.

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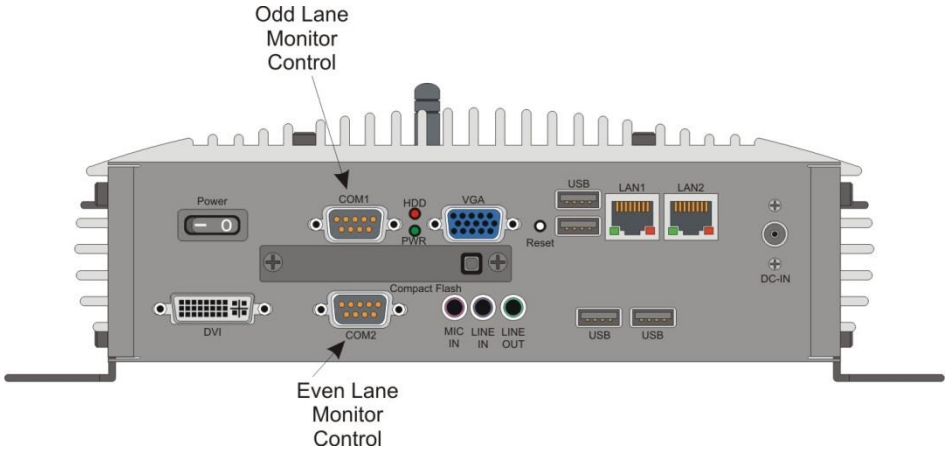
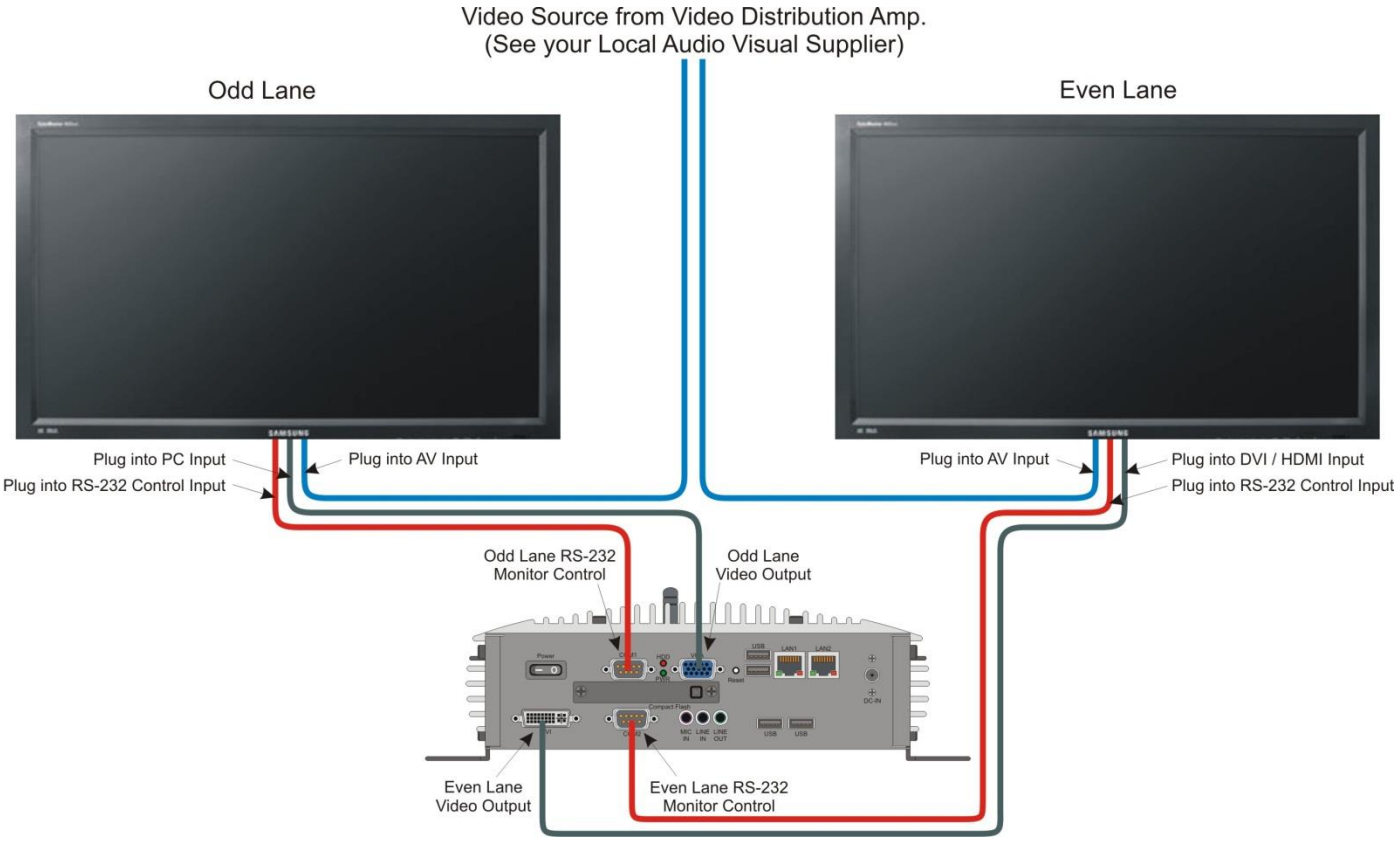
The Duo CPU Module has the ability to communicate with your monitors via an RS-232 serial link. Certain monitors include an external control port at the rear panel and upon receiving the correct control code from the Duo unit, will perform functions such as switch to and from an AV source.

In order to allow this function to occur, three areas must be addressed first:

1. Your AV supplier must cable a video source to each monitor.
2. The correct configuration file must be specified in Step 3 of the configuration Wizard. See Chapter 8 for more details on the Setup Wizard.
3. The correct DVT Serial cable must be made and connected.

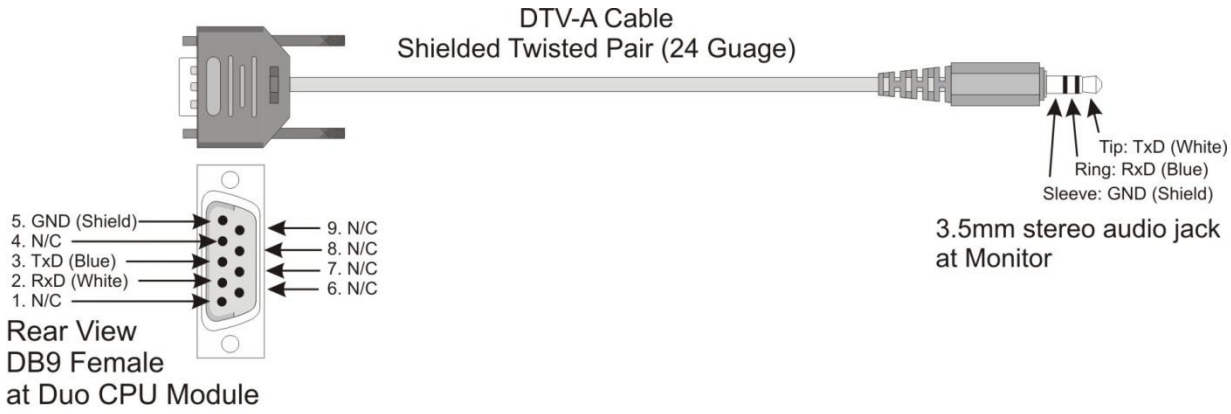


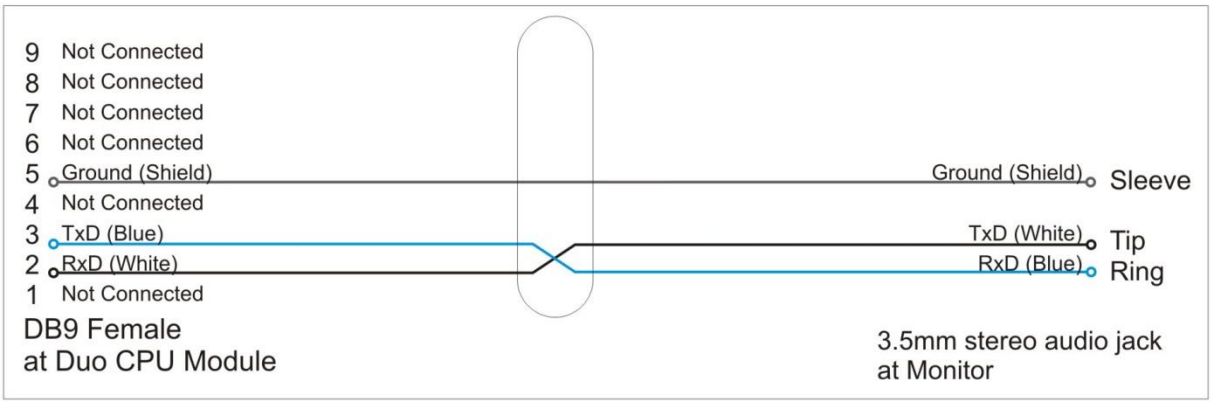


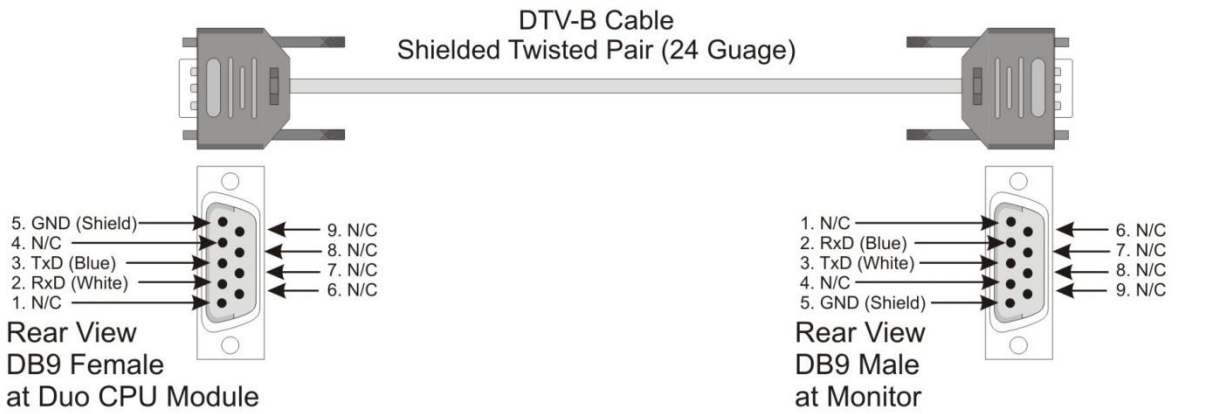
DVT Serial Cable

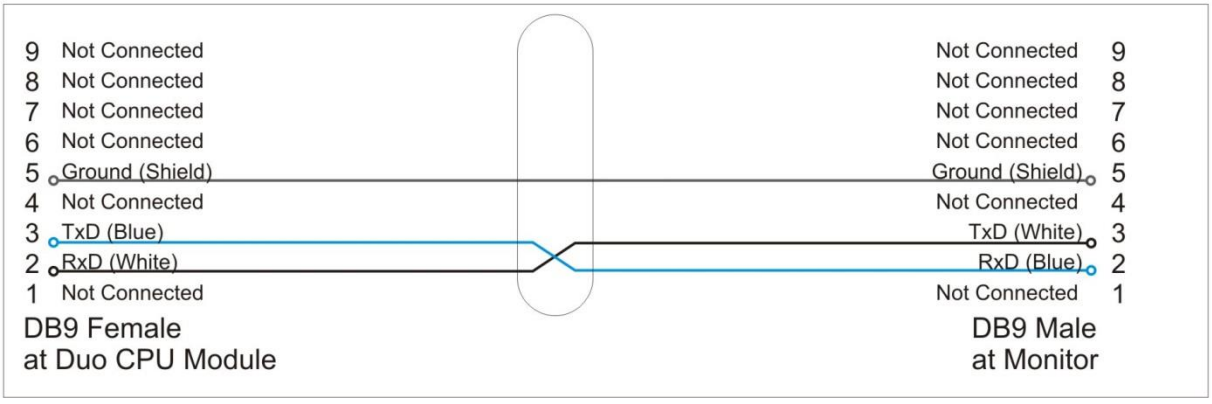
Unfortunately the various manufacturers of TV displays worldwide do not all adhere to any pre-set standard for external control for their products. Different manufactures use different commands to switch to another video source. The external control connecters used also differ from manufacturer to manufacturer.

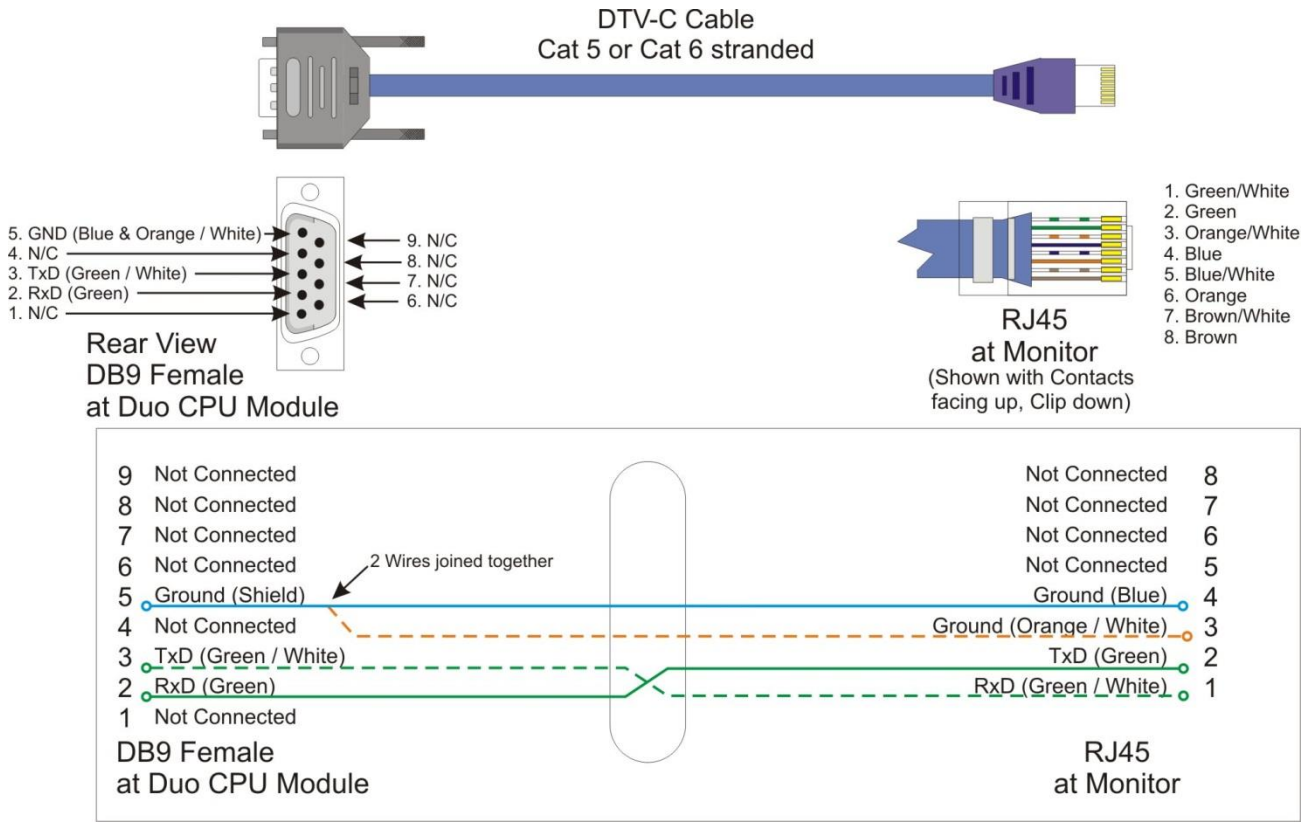
The three most common types are shown below:










DTV-C Cable
Cat 5 or Cat 6 stranded
5. GND (Blue & Orange / White)
4. N/C
3. TxD (Green / White)
2. RxD (Green)
1. N/C
9. N/C
8. N/C
7. N/C
6. N/C
Rear View
DB9 Female
at Duo CPU Module
1. Green/White
2. Green
3. Orange/White
4. Blue
5. Blue/White
6. Orange
7. Brown/White
8. Brown
RJ45
at Monitor
(Shown with Contacts
facing up, Clip down)
9 Not Connected
8 Not Connected
7 Not Connected
6 Not Connected
5 Ground (Shield)
4 Not Connected
3 TxD (Green / White)
2 RxD (Green)
1 Not Connected
2 Wires joined together
DB9 Female
at Duo CPU Module
Not Connected 8
Not Connected 7
Not Connected 6
Not Connected 5
Ground (Blue) 4
Ground (Orange / White) 3
TxD (Green) 2
RxD (Green / White) 1
RJ45
at Monitor

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What is the BIOS?

The Duo CPU Module is essentially a computer, and like any computer, it has a BIOS. The BIOS is section of battery backed up memory which holds all the settings which determine how a computer should function.

When would I need to set the BIOS defaults?

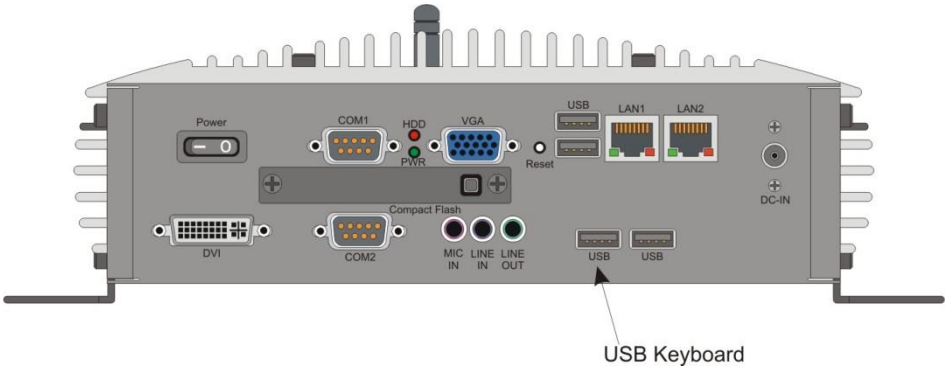
You should not normally have to change any BIOS defaults for normal operation. However, sometimes, after a number of years the small battery that holds this BIOS memory can go flat. If this happens, when a computer is turned on after being off for a period of time, it will no longer know what settings it should use to operate.

If this happens, then first replace the battery with a new one of the same type, and then re-enter the BIOS defaults. The battery model number is CR2032 3Volt Lithium.

Setting BIOS Defaults in the Duo Hardware Modules

If a Duo CPU Module loses battery power, it may be necessary to re-set the BIOS defaults before normal operation can continue. In order to do this perform the following operation:

1. Plug in a keyboard into the one of the USB ports on the CPU module.



2. Re-boot the Duo CPU Module and press the DEL key when the message appears at the beginning of the boot process.
3. This will display the System CMOS Setup screen as shown below.
4. Using the Arrow keys and the Page Up & Page Down keys, change the BIOS settings to be the same as the screens below. The Optimized Defaults should be all the settings that are needed, however, the settings required for normal operation are fully listed below. Review each screen and verify that the settings are specified as below.
5. Once finished, press the F10 button to save the changes and re-boot the Duo Unit.

Note: If this problem re-occurs the next time that the Duo unit is turned off overnight, then you will need to return the unit to your Computer Score representative so that the battery can be replaced.

DO NOT attempt to replace the battery yourself. It cannot be replaced by the end user and attempting to do so will void your warrantee.

Main Menu

Phoenix –Award BIOS CMOS Setup Utility	
Standard CMOS Defaults	Frequency / Voltage Control
Advanced BIOS Features	Load Fail Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configuration	Save and Exit Setup
PC Health Status	Exit Without Saving
ESC : QUIT **F10 : SAVE & EXIT SETUP**	8 9 : ; 6 (/ (& 7 , 7 (0
Time, Date, Hard Disk Type . . .	

Menu Item 1: Standard CMOS Features

Phoenix –Award BIOS CMOS Setup Utility Standard CMOS Features		
Date (mm:dd:yy)	Tue, May 26 2009	**Item Help**
Time (hh:mm:ss)	**9 : 39 : 34**	Menu Level >
IDE Channel 0 Master	**[InnoDisk Corp. - iCF]**	Change the Day, Month, Year and Century
IDE Channel 0 Slave	**[None]**	
IDE Channel 2 Master	**[None]**	
IDE Channel 2 Slave	**[None]**	
IDE Channel 3 Master	**[None]**	
IDE Channel 3 Slave	**[None]**	
Video	**[EGA / VGA]**	
Halt On	**[All, But Keyboard]**	
Base Memory	*640K*	
Extended Memory	*1038336K*	
Total Memory	*1039360K*	
8 9 : ; 0 R Y H (Q W H U **F5 : Previous Values**	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help** **F6 : Fail –Safe Defaults F7 : Optimized Defaults**	

Menu Item 2: Advanced BIOS Features

Phoenix –Award BIOS CMOS Setup Utility Advanced BIOS Features		
CPU Feature	**[Press Enter]**	**Item Help**
Hard Disk Boot Priority	**[Press Enter]**	
Virus Warning	**[Disabled]**	Menu Level >
CPU L1 & L2 Cache	**[Enabled]**	
CPU L3 Cache	**[Enabled]**	
Hyper Threading Technology	**[Enabled]**	
Quick Power On Self Test	**[Enabled]**	
First Boot Device	**[USB-FDD]**	
Second Boot Device	**[Hard Disk]**	
Third Boot Device	**[LS120]**	
Boot Other Device	**[Enabled]**	
Boot Up NumLock Status	**[On]**	
Gate A20 Option	**[Fast]**	
Typematic Rate Setting	**[Disabled]**	
Typematic Rate (Chars/Sec)	*6*	
Typematic Delay (Msec)	*250*	
Security Option	**[Setup]**	
APIC Mode	**[Enabled]**	
MPS Version Control for OS	**[1.4]**	
OS Select for DRAM > 64MB	**[Non-OS2]**	
Report No FDD For WIN 95	**[No]**	
Small Logo (EPA) Show	**[Disabled]**	
8 9 : ; 0 R Y H (Q W H U	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help**	
F5 : Previous Values	**F6 : Fail –Safe Defaults**	**F7 : Optimized Defaults**

Menu Item 3: Advanced Chipset Features

Phoenix –Award BIOS CMOS Setup Utility Advanced Chipset Features		
DRAM Timing Selectable	**[By SPD]**	**Item Help**
CAS Latency Time	*Auto*	
DRAM RAS# to CAS# Delay	*Auto*	Menu Level >
DRAM RAS# Precharge	*Auto*	
Precharge dealy (+RAS)	*Auto*	
System Memory Frequency	*Auto*	
System BIOS Cacheable	**[Enabled]**	
Video BIOS Cacheable	**[Disabled]**	
Memory Hole at 15M ±16M	**[Disabled]**	
PCI Express Root Port Func	**[Press Enter]**	
** *VGA Setting* **		
On-Chip Frame Buffer Size	**[8MB]**	
DVMT Mode	**[DVMT]**	
DVMT/FIXED Memory Size	**[128MB]**	
Boot Display	**[Auto]**	
Panel Number	**[640 x 480 18/1]**	
TV Standard	**[Off]**	
Video Connector	**[Automatic]**	
TV Format	**[Auto]**	
8 9 : ; 0 R Y H (Q W H U	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help**	
F5 : Previous Values	**F6 : Fail –Safe Defaults**	**F7 : Optimized Defaults**

Menu Item 4: Integrated Periphals

Phoenix –Award BIOS CMOS Setup Utility Integrated Peripherals		
On Chip IDE Device	**[Press Enter]**	**Item Help**
On Board Device	**[Press Enter]**	
Super IO Device	**[Press Enter]**	Menu Level >
Watch Dog Timer Select	**[Disabled]**	
USB Device Setting	**[Press Enter]**	
8 9 : ; 0 R Y H (Q W H U	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help**	
F5 : Previous Values	**F6 : Fail –Safe Defaults**	**F7 : Optimized Defaults**

Menu Item 4 – 1: On Chip IDE Device

Phoenix –Award BIOS CMOS Setup Utility On Chip IDE Device		
IDE HDD Block Mode	**[Enabled]**	**Item Help**
IDE DMA transfer access	**[Enabled]**	
On-Chip Primary PCI IDE	**[Enabled]**	Menu Level >
IDE Primary Master PIO	**[Auto]**	
IDE Primary Slave PIO	**[Auto]**	
IDE Primary Master UDMA	**[Auto]**	
IDE Primary Slave UDMA	**[Auto]**	
On-Chip Secondary PCI IDE	**[Enabled]**	
IDE Secondary Master PIO	**[Auto]**	
IDE Secondary Slave PIO	**[Auto]**	
IDE Secondary Master UDMA	**[Auto]**	
IDE Secondary Slave UDMA	**[Auto]**	
IDE HDD Block Mode	**[Enabled]**	
**** On-Chip Serial ATA Setting ****		
SATA Mode	**[IDE]**	
On-Chip Serial ATA	**[Enhanced Mode]**	
SATA PORT Speed Settings	**[Disabled]**	
PATA IDE Mode	*Secondary*	
SATA Port	*P0, P2 is Primary*	
8 9 : ; 0 R Y H (Q W H U	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help**	
F5 : Previous Values	**F6 : Fail –Safe Defaults**	**F7 : Optimized Defaults**

Menu Item 4 – 2: Onboard Device

Phoenix –Award BIOS CMOS Setup Utility Onboard Device		
Azalia/AC97 Audio Select	**[Auto]**	**Item Help**
Onboard LAN1 Device	**[Enabled]**	
Onboard LAN2 Device	**[Enabled]**	Menu Level >
Onboard LAN Boot ROM	**[Disabled]**	
8 9 : ; 0 R Y H (Q W H U	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help**	
F5 : Previous Values	**F6 : Fail –Safe Defaults**	**F7 : Optimized Defaults**

Menu Item 4 – 3: Super IO Device

Phoenix –Award BIOS CMOS Setup Utility Super IO Device		
Onboard Serial Port 1	**[3F8/IRQ4]**	**Item Help**
Onboard Serial Port 2	**[2F8/IRQ3]**	
COM2 RS232/422/485 Setting	**[RS232]**	Menu Level >
Onboard Parallel Port	**[378/IRQ7]**	
Parallel Port Mode	**[SPP]**	
ECP Mode Use DMA	*3*	
8 9 : ; 0 R Y H (Q W H U	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help**	
F5 : Previous Values	**F6 : Fail –Safe Defaults**	**F7 : Optimized Defaults**

Menu Item 4 – 4: USB Device Setting

Phoenix –Award BIOS CMOS Setup Utility USB Device Setting		
USB 1.0 Controller	**[Enabled]**	**Item Help**
USB 2.0 Controller	**[Enabled]**	
USB Operation Mode	**[High Speed]**	Menu Level >
USB Keyboard Function	**[Enabled]**	
USB Mouse Function	**[Enabled]**	
USB Storage Function	**[Enabled]**	
8 9 : ; 0 R Y H (Q W H U	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help**	
F5 : Previous Values	**F6 : Fail –Safe Defaults**	**F7 : Optimized Defaults**

Menu Item 5: Power Management Setup

Phoenix –Award BIOS CMOS Setup Utility Power Management Setup		
Video Off Method	**[DPMS]**	**Item Help**
Video Off in Suspend	**[Yes]**	
Suspend Type	**[Stop Grant]**	Menu Level >
MODEM use IRQ	**[3]**	
Suspend Mode	**[Disabled]**	
HDD Power Down	**[Disabled]**	
Soft-Off by PWR BTTN	**[Instant-Off]**	
Power On by Ring	**[Enabled]**	
Resume by Alarm	**[Disabled]**	
Date (of Month) Alarm	*0*	
Time (hh:mm:ss) Alarm	*0 : 0 : 0*	
*** Reload Global Timer Events *****		
Primary IDE 0	**[Disabled]**	
Primary IDE 1	**[Disabled]**	
Secondary IDE 0	**[Disabled]**	
Secondary IDE 1	**[Disabled]**	
FDD, COM, LPT Port	**[Disabled]**	
PCI PIRQ(A-D)#	**[Disabled]**	
8 9 : ; 0 R Y H (Q W H U	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help**	
F5 : Previous Values	**F6 : Fail –Safe Defaults**	**F7 : Optimized Defaults**

Menu Item 6: PnP / PCI Configuration

Phoenix –Award BIOS CMOS Setup Utility PnP / PCI Configuration		
		Item Help
Init Display First	**[PCI Slot]**	
Reset Configuration Data	**[Disabled]**	Menu Level >
Resources Controlled By	**[Auto (ESCD)]**	
IRQ Resources	*Press Enter*	
PCI/VGA Palette Snoop	**[Disabled]**	
INT Pin 1 Assignment	**[Auto]**	
INT Pin 2 Assignment	**[Auto]**	
INT Pin 3 Assignment	**[Auto]**	
INT Pin 4 Assignment	**[Auto]**	
INT Pin 5 Assignment	**[Auto]**	
INT Pin 6 Assignment	**[Auto]**	
INT Pin 7 Assignment	**[Auto]**	
INT Pin 8 Assignment	**[Auto]**	
** PCI Express relative items **		
Maximum Payload Size	**[128]**	
8 9 : ; 0 R Y H (Q W H U	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help**	
F5 : Previous Values	**F6 : Fail –Safe Defaults**	**F7 : Optimized Defaults**

Menu Item 7: PC Health Status

Note: Values will be not be exactly the same as the ones shown here

Phoenix –Award BIOS CMOS Setup Utility PC Health Status		
		Item Help
+5VSB	*4.97V*	
CPU Voltage	*0.88V*	Menu Level >
DDR2 Voltage	*1.84V*	
+5V	*5.02V*	
+12V	*12.03V*	
+1.05V	*1.04V*	
+1.5V	*1.47V*	
+3.3V	*3.16V*	
Voltage Battery	*3.08V*	
System FAN	*41°C*	
Fan 1 Speed	0 RPM	
Fan 2 Speed	0 RPM	
8 9 : ; 0 R Y H (Q W H U	**+/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help**	
F5 : Previous Values	**F6 : Fail –Safe Defaults**	**F7 : Optimized Defaults**

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The CPU on the Duo Hardware module is designed to throttle down in speed or even re-boot in the event of overheating in order to protect the unit from damage. The main cause of system overheating is either excessive dust build up or failure of the CPU fan.

Duo CPU Module

It is highly recommend that approximately every six months you should perform the following procedure:

1. Turn off the Duo CPU module with the power switch and remove the power cord.
2. Clean the Duo CPU Module by blowing out any dust that has accumulated. You can use either an air compressor, or a can of compressed air, which should be available from your local electronics store. DO NOT use any solvents or any other cleaning products on the Duo CPU Module. DO NOT open the Duo CPU module, there are no user serviceable parts inside.
3. Plug in the power cord and turn the unit on.

Duo Camera Module (If fitted)

It is highly recommend that approximately every six months you should perform the following procedure:

1. Remove the top cover. (There is no need to remove the entire module)
2. Pull out the LLAN In plug to turn the Duo Unit Off.
3. Clean the Duo Camera Unit by blowing out any dust that has accumulated. You can use either an air compressor, or a can of compressed air, which should be available from your local electronics store. DO NOT use any solvents or any other cleaning products on the Duo Camera Unit.
4. Clean any dust away from the Camera Lens by using a clean, dry, soft cloth. Do not move the camera or you will then need to re-configure the camera.
5. Replace the top cover and check that the scoring operation is still OK.